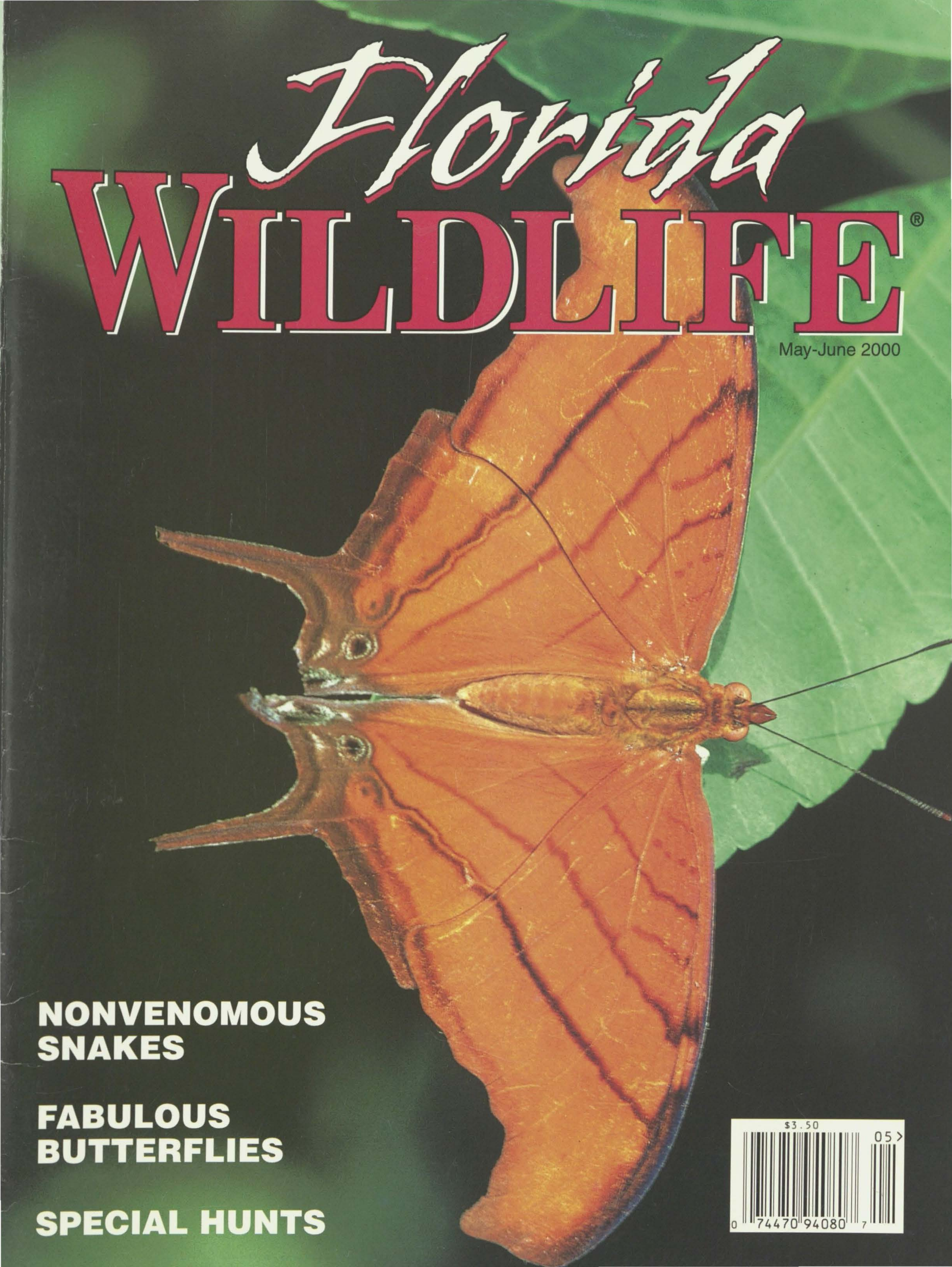
Florida WILDLIFE®

May-June 2000



NONVENOMOUS SNAKES

FABULOUS BUTTERFLIES

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A Message From the Executive Director

There is never enough money to meet fish and wildlife needs. Floridians who attend meetings of the Fish and Wildlife Conservation Commission (FWC) have heard staff tell of the funding shortages in the new agency. Pick any part of the FWC: law enforcement, wildlife management areas, lake drawdowns, research on the effects of harvest on fish and wildlife populations or manatee protection. There are not enough dollars to do the work that almost everyone agrees needs to be done.

But, now comes hopeful news. There is legislation pending in Congress, the Conservation and Reinvestment Act (CARA HR 701/S 2123), that would provide a significant increase in conservation funding if passed. HR 701/S 2123 would send as much as $141 million annually to Florida, including almost $15 million devoted to wildlife conservation alone. In addition, the coastal impacts assistance section (Title I) would provide almost $70 million annually for various projects that cover marine fisheries, law enforcement, pollution control and other coastal issues.

Moreover, the legislation provides funds for conservation easements to compensate landowners whose properties harbor endangered species ($2.5 million), monies for state park acquisition ($19.5 million), for protection of historical resources ($2.2 million), lands restoration ($5 million) and urban parks ($6 million). All told, CARA would provide a huge boost for conservation, not just in Florida but nationally.

And all this could happen without Congress passing any new taxes. The funding source is the rents and royalties collected by the federal government on oil and gas leases on the Outer Continental Shelf. Thankfully, HR 701/S 2123 has strong language that precludes incentives to new leasing or drilling. In fact, no money coming from areas under a leasing/drilling moratorium as of January 1, 1999, would be used for any CARA programs.

At least 20 of Florida's 23 House members are cosponsors of the proposed legislation: Representatives Bilirakis, Boyd, Brown, Canady, Deutsch, Diaz-Balart, Foley, Fowler, Goss, Hastings, McCollum, Meek, Mica, Miller, Ros-Lehtinen, Scarborough, Shaw, Stearns, Thurman and Wexler. Passage of HR 701 is likely. There is less certainty with S 2123 in the U.S. Senate, however. It remains to be seen if a similar momentum can be developed. Senators Graham and Mack have not yet signed on the new Senate version.

If CARA becomes law, at least for the next 15 years, fish and wildlife conservation funding will be reasonably secured. The challenge will then be to use the new funds wisely. The FWC is committed to ensuring that Floridians have a strong voice in how that is done. Stay tuned for details. If you would like to help with CARA's passage, consider sending a polite note to your representative and senators, thanking them for their support if they have already signed on and encouraging them to do so if they have not. Information on CARA can be found on our Web site **www.state.fl.us/fwc/** by following the Teaming with Wildlife link.

–Allan L. Egbert, Ph.D.

contents

VOLUME 54, NUMBER 3 May-June 2000

3 **Fabulous Florida Butterflies**, by Thomas C. Emmel
These fragile creatures are a wonder of nature.

6 **The NABA Biennial Meeting**, by Rita Venable
Some will come early and stay late to explore a Mecca for butterfly lovers.

7 **Saving the Schaus Swallowtail Butterfly**,
by Thomas C. Emmel
The inside story on how a rare butterfly avoided extinction.

9 **All Along the Food Chain**, by Kelly Ashey
Hawks, squirrels and cats can disrupt the best laid plans.

10 **Hunts That Are Special**, by James Call
It's hunting the way it was meant to be.

12 **Five Tips for Catching Bass**

13 **Nonvenomous Snakes of Florida**,
by D. Bruce Means, Ph.D.
A closer look at one of nature's more misunderstood animals.

21 **Wildlife Friend: Kissimmee River Valley Sportsman Association**, by James Call
An effort to protect sporting rights grows into a conservation support organization.

22 **Conservation And Recreation Lands**,
by James Call
Here's a list of where they are and what you can do there.

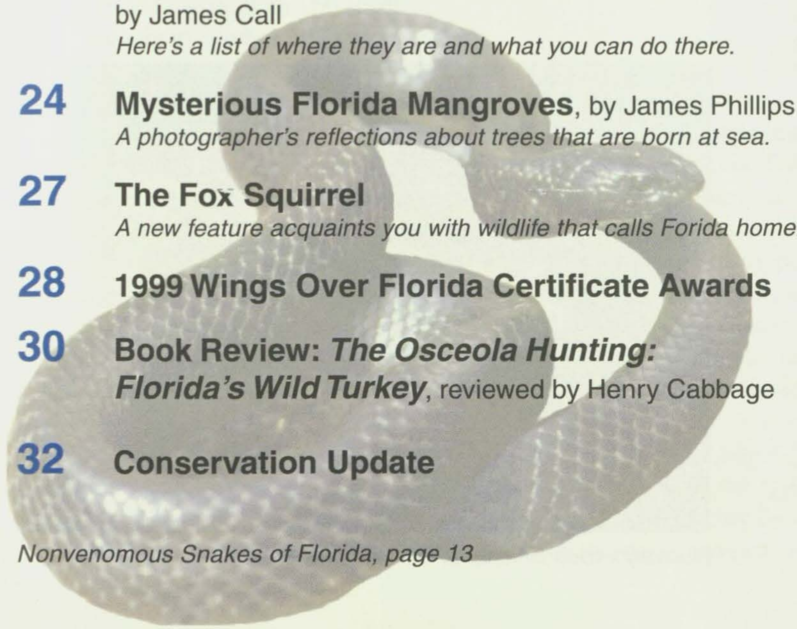
24 **Mysterious Florida Mangroves**, by James Phillips
A photographer's reflections about trees that are born at sea.

27 **The Fox Squirrel**
A new feature acquaints you with wildlife that calls Forida home.

28 **1999 Wings Over Florida Certificate Awards**

30 **Book Review: *The Osceola Hunting: Florida's Wild Turkey***, reviewed by Henry Cabbage

32 **Conservation Update**



Nonvenomous Snakes of Florida, page 13

Five Tips for Catching Bass, page 12

Hunts That Are Special, page 10

Fabulous Florida Butterflies, page 3

COVER
The front cover photo of a ruddy daggerwing butterfly was taken by Kevin Barry

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Florida Fish and Wildlife Conservation Commission
2000
Publisher

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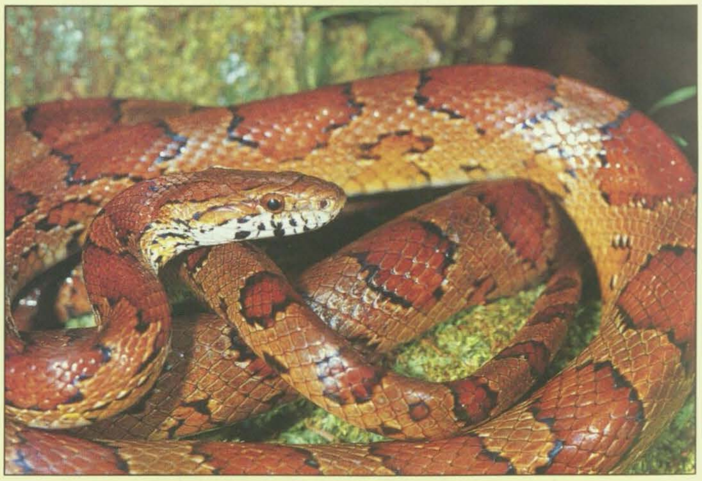

Nonvenomous Snakes of Florida, page 13

Eastern Tiger Swallowtail (female) by Thomas C. Emmel

Fabulous Florida Butterflies

By Thomas C. Emmel

Butterflies now excite the interest of more people than ever. This interest is seen in people's fascination with butterfly gardening, the popularity of new books and wildlife exhibits, public gardens and landscaping plans for highways that include butterflies as a wildlife group.

In Florida more than 160 species breed and about another 200 species have been recorded passing through. Many of these butterflies are not found anywhere else in North America. That may explain the worldwide attention on efforts to prevent the extinction of the Schaus swallowtail butterfly, a large and colorful denizen of the tropical hardwood hammocks in the Florida Keys. Despite the challenges presented by pesticides, bulldozed habitats and even Hurricane Andrew in 1992, the species has survived and is thriving today in a remarkable comeback aided by Floridians (see accompanying story).

There are many other remarkable species among fabulous Florida butterflies. Thus for example, in the sandhills around Tampa Bay and Sarasota, or along the east coast beaches such as Crescent Beach south of Jacksonville, one can find two species of giant skippers. These remarkable butterflies fly as fast as 40 mph, darting and weaving through the dunes in search of mates and plants, and are on the wing for only a few days in spring or fall. Much of the rest of the year, they spend as caterpillars, deep inside yucca plants. After the eggs hatch on the leaf surface, the larvae bore their way inside the spiny leaves and then the main stems, before they descend into the root below ground where they will eventually pupate. Before it changes into a pupa, however, the larva, now almost three inches in length, builds a little tower of pebbles and sticky silk, sticking up above the ground or from the center of the plant some five or six inches. It then descends back into its burrow to change into a pupa. The following year, the adult giant skipper emerges and quickly climbs up its burrow into the tower, moistens the silk at the top of the tower with a secretion from its tongue (dissolving the glue there) and ▷

A gulf fritillary butterfly
Page 3: An eastern tiger swallowtail butterfly

A sulfer butterfly

Page 4 butterflies by Barry Mansell

crawls out to hang on the tower and pump fluid into its tiny crumpled wings to expand them. If you are lucky enough to see this event, you will note that the butterfly hangs on its tower quietly for an hour or two, until its wings dry and it can try them in free and rapid flight. The adult lives only a couple days in pursuit of sex and then a yucca plant for its eggs.

In the Florida Keys, if you keep your eyes open for small and brightly colored lycaenid butterflies around the flowers and near the ground, you will see lots of interesting behavior. The Bartram's hairstreak, for instance, is endemic to the Keys and the adjacent southern mainland, where it flies in close contact with its larval host plant, a woolly croton which grows in the tropical pinelands. Its bold markings on the underside include a red patch near the base of the tails, and a white line and spots. As the butterfly perches on a branch or lands on a flower, it twitches its hindwings back and forth, waving the two long tails in the breeze like tiny antennae in front of giant red eyes with covering white lines. This false eyespot pattern apparently is effective with insect-eating birds and lizards, because one often encounters these hairstreaks with missing tails or parts of the hindwing – parts they can easily lose without injuring their flight or shortening their lifespan, compared to losing their real head at the other end of their body! Such deflection patterns are found among many other hairstreaks in the keys.

If one finds a long twining balloon vine (*Cardiospermum*) at the edge of a tropical hardwood hammock, one may have the good fortune to see the Miami blue or the San Christopher's hairstreak (*Chlorostrymon simaethis*). The females of both species lay their eggs near the base of young pods of balloon vine and the newly hatched larvae eat through the thin outer wall of the pod and feed on the developing seeds. You can find the pods containing larvae of either species by looking for fruit with holes, or for the dark droppings which accumulate inside and may be seen through the thin walls of the pod. The larvae leave the pods to pupate in leaf litter at the base of the vine. Both species are abundant in the upper keys and across south Florida. The Miami blue is bright blue above, with black borders and a grayish underside covered with white-edged darker markings and two pairs of eyespots on the underside of the hindwing. The St. Christopher's hairstreak is about the same size, but has brilliant iridescent violet upperside in the males and black and grayish blue upperside in the female. The underside is a beautifully yellowish-green with a conspicuous silvery white line on all four wings. There is only one tail on each hindwing, with a reddish patch at its base.

Among our largest butterflies in Florida are the 10 swallowtail species, widely distributed across the state. The eastern black swallowtail occurs across the state, along with the white and black striped zebra swallowtail. The black and yellow-spotted polydamas swallowtail is found around pipevines, along with its close relative, the pipevine swallowtail, whose wings shimmer in a bright iridescent bluish-purple. The large black and yellow palamdes swallowtails and bluish-black spicebush swallowtails are common from north Florida to south Florida, and the boldly patterned giant swallowtail is familiar to everyone, as it occurs in every county in the state.

Less known is the Bahamian swallowtail, which flies only in Biscayne National Park and looks a lot like the Schaus swallowtail. One of the most familiar species is the eastern tiger swallowtail, which flies from the Georgia border south to the Big Cypress Swamp region. It is especially interesting because the yellow and black-striped males are matched by yellow and black-striped females, but throughout Florida, one may also encounter a melanic female form of the tiger swallowtail. These dark females reach particular abundance in the southern half of our state, where the pipevine swallowtail also flies in numbers. It is believed that the pipevine swallowtail serves as a distasteful decoy to predators for the dark females. Pipevine larvae pick up poisonous compounds from plants and pass them on to the adults. A bird will grab a pipevine swallowtail adult and receive a sharp distasteful sensation, thereupon releasing it promptly. Predators mistake the dark female tiger swallowtails for the odious pipevine species and leave them alone.

Spend much time in Florida between September and November and you are likely to see millions of cloudless sulfur butterflies flying south. Motorists driving east to west can spot thousands per hour heading south or southeastward across the roads. The same migration occurs in the spring, going north, but is less noticeable because it is spread out over more months. This species breeds in our state on cassia weeds and planted shrubs, and takes advantage of the warm summers to the north to have more generations as far north as New York and New England. But all those butterflies turn south again in the fall as the weather changes.

Flying with the cloudless sulfur in their massive migrations are less noticeable numbers of monarchs, primarily because many of the monarchs turn off to the west when they reach the Gulf Coast on their southward movements towards Mexico in the fall. But among the cloudless sulfurs, one will see millions of long-tailed skippers, gulf fritillaries and almost a dozen other species heading south to the tropical end of Florida to winter, or to pass through Miami on their way further south to the deeper tropics.

One of the most amazing stories of Florida butterflies is that of the Atala butterfly, a gorgeous hairstreak resident of south Florida. The males are black with brilliant metallic green on the forewing and a narrow greenish line along the outer border of the hindwing. Females are also black, but have a streak of blue along the rear margin of the forewing. Both sexes have a bright red abdomen, and the underside of the hindwing is black with bright blue spots and a red patch.

This species used to be found abundantly in tropical pinelands and hardwood hammocks in close association with its larval food plant, the native cycad called coontie. The development of its coastal habitat nearly wiped out the Atala. By 1965 there was just one known population living in Hugh Taylor Birch State Park. That colony died and the butterfly was thought to be extinct. But in the late 1970s another colony was found on Virginia Key, and with the aid of local conservationists, potted coontie plants were placed in this last colony and plants with eggs were then moved to other locations and new colonies started. Today the Atala has made a spectacular recovery and is found throughout the urban and natural areas around Ft. Lauderdale and Miami, and has also been successfully introduced into Everglades National Park. Today, you may enjoy this species in your backyard anywhere in south Florida if you take the time and trouble to plant some coontie cycads or more exotic cycad species.

This weekend, take a look around your backyard and see if you can find some of these species of fabulous Florida butterflies. If you don't see many, take a trip to your local nursery and ask to see their butterfly gardening section, where you can pick up a few plants to feed the caterpillars and provide nectar to the adults. Butterflies will make your life a lot more interesting and help your children get attuned to the world of nature. In the process, a great appreciation will grow for these winged wonders of the insect world, whose bright colors, fascinating behavior and even their basic metamorphosis through egg, larval, pupal and adult stages never fails to illicit a sense of wonder and awe in the natural world.

Thomas C. Emmel is a professor and director of the Division of Lepidoptera Research at the University of Florida, Gainesville.

Thomas C. Emmel

A pipevine swallowtail butterfly

The NABA Biennial Meeting

Palm Beach Springs, Florida

By Rita Venable

Zebra swallowtail butterfly by Thomas C. Emmel

By their hats and close-focusing binoculars you will know them – the people who watch butterflies. Soon Palm Beach Gardens will be stirring with butterfly lovers ranging in age from five to 80+ for the fourth biennial North American Butterfly Association (NABA) Members' Meeting, May 18-21, 2000.

One reason that Palm Beach Gardens on Florida's southeast coast was chosen for the conference site is because there are butterfly species there that are found nowhere else in the United States such as the Atala and Schaus swallowtail. The Atala was once considered extirpated from the United States until Florida gardeners began planting more coontie species and other cyads. This boosted the populations so they are now considered "booming" according to the *Butterflies through Binoculars-The East* (Oxford University Press, 1999).

The Schaus swallowtail is another story. Since 1984 Schaus swallowtail has been federally listed as an endangered species – the only butterfly in Florida with such a distinction. Schaus swallowtail was originally named in 1911 for physician William Schaus, who was stationed in Miami during the Spanish-American War. Dr. Schaus treated American soldiers suffering from yellow fever and in his spare time collected specimens of the newly discovered swallowtail. Schaus are considered by many to be North America's rarest butterfly.

Other especially beautiful butterflies found in south Florida include zebra longwings, ruddy daggerwings, white peacocks, dina yellows and mangrove skippers. Malachites and Florida leafwings live in the area, as do two species of purplewings, the dingy purplewing and the Florida purplewing.

The NABA is making a point to recruit people into their ranks. Some of the conference field trips will be for beginners only, and one does not have to be a member of NABA to attend the conference. "Everybody is new to butterflying. It's not like there are thousands of experts and the rest of us are just coming along," said NABA founder Jeff Glassberg. "This is a tremendously fun and exciting way to enter the world of butterflies and learn the species that are in your own state of Florida," he says. "This is the way to do it."

Field trip highlights include the Loxahatchee National Wildlife Refuge. There will also be auctions, raffles, and programs with speakers who focus on identification, gardening, photography and butterfly counts.

So, expect a major migration of butterfly lovers to Palm Beach County around the middle of May. As with birds and butterflies, several will come early, some will stay late and a few will do both. There will be lots of kindred spirits there. Fly with them for a while; you will be welcomed.

Rita Venable is an active member of the Southeastern Outdoor Press Association and the Outdoor Writers of America.

North American Butterfly Association (NABA) Member's Meeting May 18-21, 2000

For more information contact:

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Alana Edwards
NABA Meeting Co-chairs
3206 Palm Drive
Delray Beach, FL 33483
561-706-6732

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tleaj@earthlink.net

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No nets are permitted.

Saving the Schaus Swallowtail Butterfly

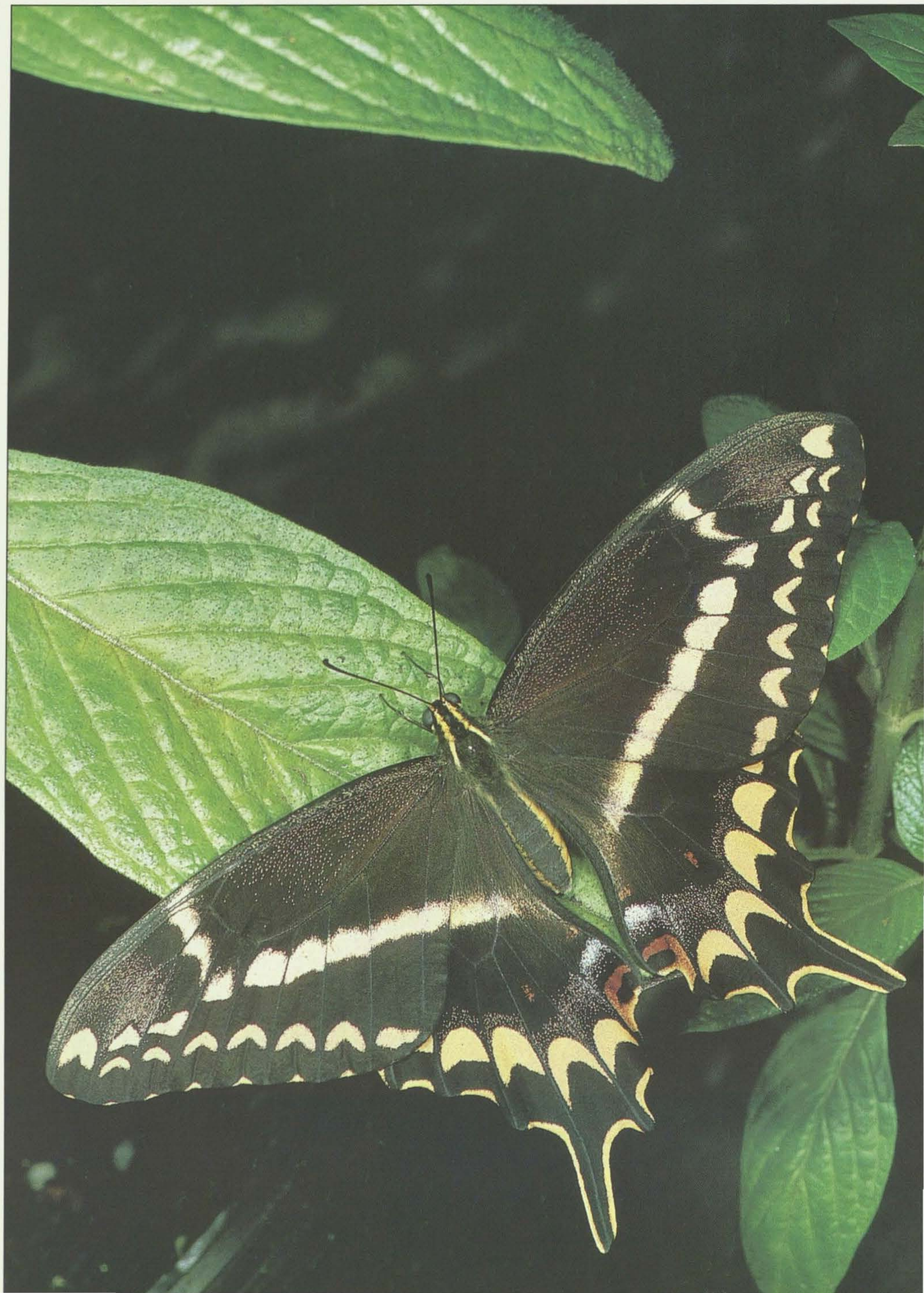
Text and Photographs by Thomas C. Emmel

This is one of the great success stories of endangered species conservation in the United States, comparable to the saving of the California condor in California, the Black-footed Ferret in Wyoming and the Whooping Crane in the Great Plains prairies.

The Schaus swallowtail butterfly (*Papilio aristodemus ponceanus*) once flew from Miami to Key West, but its extensive distribution and population steadily decreased over the last century due to development and the use of pesticides. By 1984, the species' habitat was reduced to an area less than ten miles in size on the northern tip of Key Largo and several small islands inside Biscayne National Park. With fewer than 70 adults, it was listed officially by the federal government as an endangered species that year. On August 24, 1992, Hurricane Andrew dealt a further blow by destroying virtually all of its wild habitat.

The small colony in captive propagation at the University of Florida became the only source for reintroduction of this rare butterfly back into the wild. Fortunately, the recovery program started from this laboratory colony has been a remarkable success. Hundreds of butterflies were reared annually for release into suitable and protected habitat areas in 1995, 1996 and 1997.

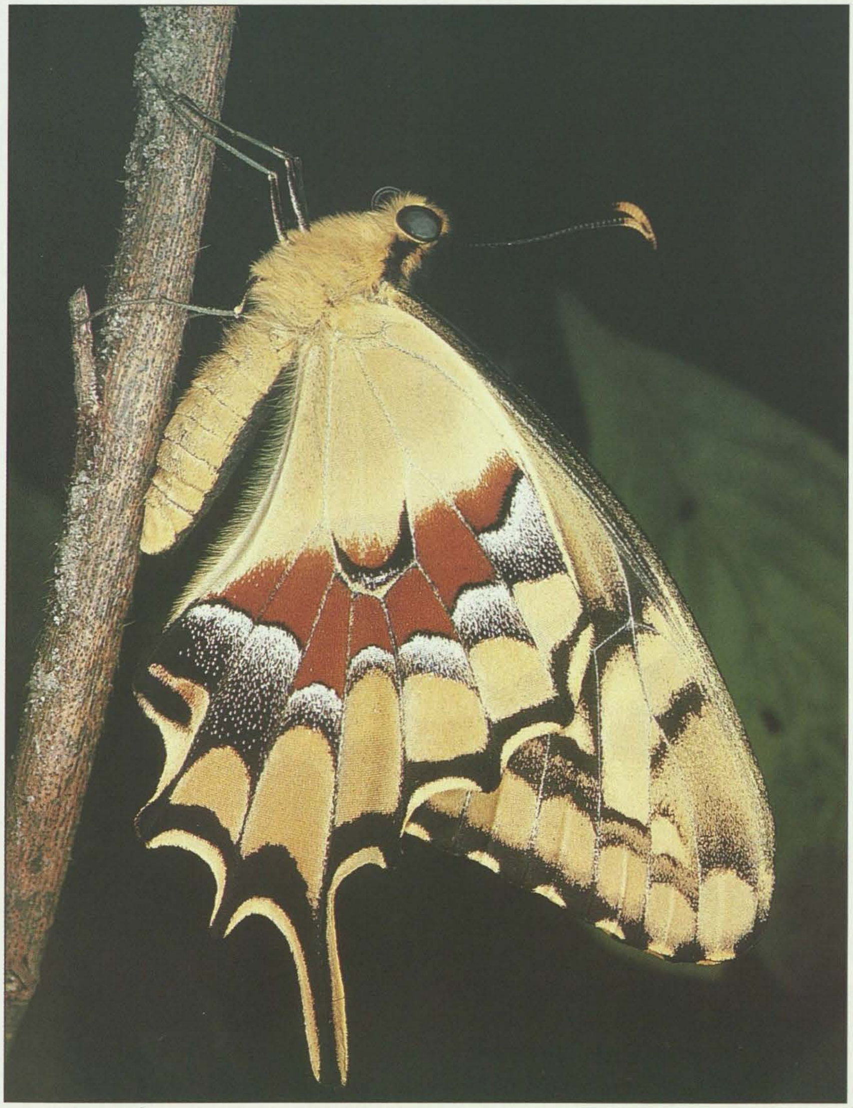
Following these three years of reintroduction, this endangered species now occupies 13 sites, stretching from the Charles Deering Estate Park in the south Miami area in Dade County, to the middle keys of Monroe County, a ▷



geographic range of 60 miles or more. Thus the reintroduction program has resulted in a much-needed restoration of the species to a wider geographic range, and also increased the total adult population of the Schaus swallowtail in the wild to at least 1,200 butterflies flying annually.

While it would be wonderful to be able to declare that the conservation and recovery of the Schaus swallowtail butterfly was successfully completed, the work is not done. The Schaus research group at the University of Florida believes it is important to improve the habitat in some of the species' current range. The group is also trying to work out a way to allow effective gene flow between the now-numerous but isolated populations.

Of course, historically, the Schaus swallowtail enjoyed a range of pristine tropical hardwood hammock habitat throughout the Florida Keys, broken only by periodic short water barriers between the islands which adults could easily cross. Individuals from neighboring colonies on different Keys could regularly visit each other, allowing a healthy gene flow between populations annually or at least frequently. If periodic waxing and waning of local population occurred – in response to environmental fluctuations such as rainfall affecting plant growth, changes in predators or parasites, and occasional storm damage to the habitat – immigrants from other areas could restore the population numbers the next year. Today, that condition for the species' continued healthy existence is not as available, because of the very factors (expansion of urban areas, roads, pesticide spraying) which caused the demise of the butterfly to near extinction in the first place.



A Schaus butterfly underwing pattern. See page 7 for top side of wings.

Therefore, an aggressive program of habitat restoration was started in 1998. With the cooperation of the U.S. Fish and Wildlife Service Refuge Manager on Key Largo and the Department of Environmental Protection staff in Region V for the State of Florida, hundreds of wild lime trees and torchwood trees (larval hostplants for the Schaus) and nectar-source plants (for the adults) are being planted now on old roadsides and abandoned building sites contained in federal and state land parcels on Key Largo. The hope is to extend this replanting effort further south on federal and state lands. This past winter (1999-2000), a new effort involving private landowners was started as well.

Two large golf clubs, the Cheeca Lodge on Upper Matecumbe Key and the Sombrero County Club on Vaca Key just south of Marathon, agreed to join in cooperation with the University of Florida, the U.S. Golf Association, the National Fish and Wildlife Foundation and the U.S. Fish and Wildlife Service in planting extensive reintroductions of native adult nectar sources and larval host plants in the "rough" areas between the golf course fairways. This new project will create significant natural habitat, suitable to maintain and nourish adult butterflies that are flying through as transients between the scattered reintroduced colonies in the Upper and Middle Keys, and the new habitats may also lead to the establishment of new breeding colonies on these private protected sites in the Middle Keys.

These exciting developments are thus part of an ongoing conservation story, one which is seemingly headed towards a happy ending and the removal of an endangered butterfly (a symbol of the wild tropical environment of south Florida) from the Endangered Species category in the near future. THAT conclusion to the Schaus's saga will make EVERYONE happy!

Thomas C. Emmel is a professor and the director of the Division of Lepidoptera Research and director of the Endangered Species Laboratory at the University of Florida in Gainesville.

All Along the Food Chain

By Kelly Ashey

The osprey lifts itself from the oak treetop and circles to the left and behind me, clutching what looks like a fish in its talons. In our wooded neighborhood near Lake Jackson osprey, hawks and owls are common sights. We watch them soar in the sky above our home and yard.

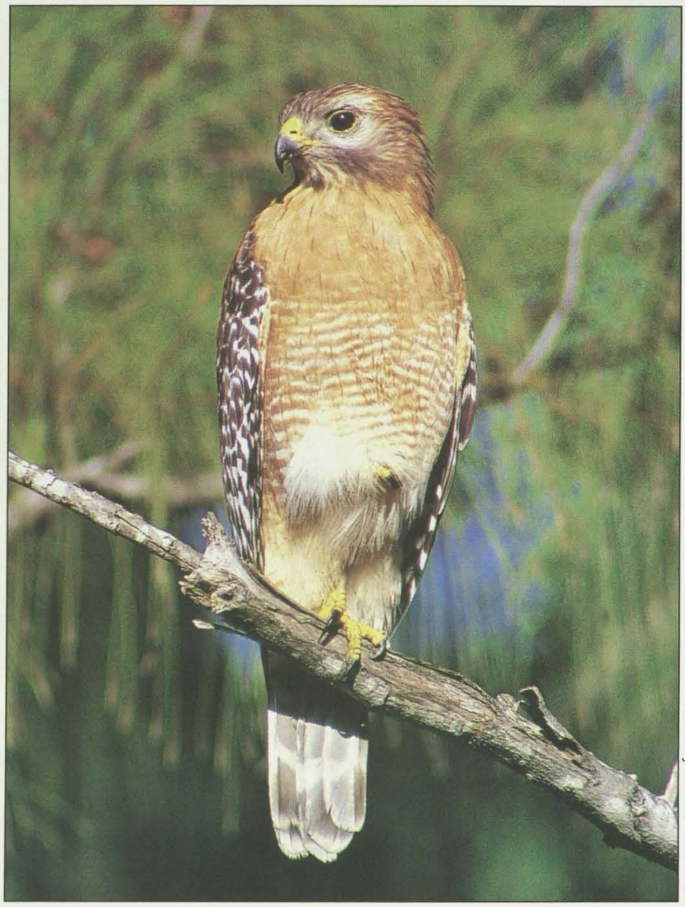
The first time we found a dead fish in our backyard we were quite puzzled over how it got there. We gaped at it for a long minute before concluding that it must have been dropped by a passing bird. If not, I thought, then Lake Jackson harbors a new species of walking fish. A backyard that is wildlife friendly makes life interesting.

Nestled among our pine trees is a bird and butterfly garden with water, feeders and shelter for small birds and other animals. As birds twitter and hop from the dogwood to the safflower feeder and back, silent death swoops down and snatches a chickadee from our garden oasis. The first time I saw a red-tailed hawk strike I realized I had created a feeding station in more ways than one.

Try as I may, I cannot control who comes to my feeders and who stays away. Squirrels are frequent intruders and I'm outside every few months devising new feeder guards to keep them from eating more than their fair share. I've been known to creep, a long bamboo pole in hand, out to the pine tree where those rascally critters are munching on my suet. A good whack on the trunk keeps them away for a while, long enough for the red-bellied woodpeckers to snatch a couple bites.

I've never actually connected a squirrel with my pole or whatever else is handy (my kids keep a supply of plastic hockey sticks and bats lying nearby), nor do I really want to. Our two sons get all soft on me and entreat me not to hurt them. That's okay. The boys do their part to chase the squirrels away, flying out the back, flinging themselves off the deck and barking just like dogs. (I can only hope our neighbors aren't witnessing any of this.)

A backyard that is wildlife friendly makes life interesting.



Red-shouldered hawk by Charlie Heidecker

There are other hungry mouths lurking around my bird feeders, cats. We don't have a cat due to an allergy of a certain family member who I won't identify. Although I will acknowledge that his sons keep suggesting that said allergy can be cured with shots and other schemes. While I would like to have a kitten for the boys, I can't bring myself to lure birds to the yard with the offering of food and shelter, and then let loose a feline stalker.

The neighborhood cats, however, are another story. I have discovered that those Super Soaker squirt guns with a 50-foot range are an integral part of my anti-intruder arsenal. Now I hunt the cats that hunt the birds. My vision of a tranquil backyard paradise has been usurped by an up close study of life along the food chain.

Fortunately, in Leon County humans are at the top. Thus far the only thing to venture out of nearby Lake Jackson and into our yard are turtles and not alligators and water moccasins. The eldest son astutely pointed out that some birds eat butterflies and caterpillars, other welcomed guests at the backyard food bar. It seems you're either the eater or the eaten. That's nature.

The flowers, plants and feeders that we maintain to attract wildlife to our yard have added much to our lives. Chickadees serenade us at sunrise each day, despite the risk from treetop marauders and while raucous blue jays hustle to get to the feeders first. My woodpecker friends (all named Chuck) wait patiently for the suet and sometimes they stand their ground against the jays. Yes, it is a jungle out there. I love every bit of it.

Kelly Ashey is a free-lance writer who lives in Leon County.

Barry Mansell

Hunts That Are Special

By James Call

"It's very quiet. It's a peaceful time of hunting, almost spiritual." That's how Palm Beach County resident James Moore described a special-opportunity hunt, a program the Florida Fish and Wildlife Conservation Commission (FWC) started in 1997.

"You are at ease and see more game. The game is not pushed, not pressed as they are in areas that are opened to the public. The game is much more in its natural state," said Moore.

A special-opportunity hunt is a chance to hunt a Wildlife Management Area with limited competition from other hunters. The FWC holds a lottery to issue the right to purchase a permit to people who paid a fee to enter the drawing. The idea came from a survey the FWC commissioned to find out what people wanted in a hunting experience. Hunters said they were willing to pay extra to hunt in secluded areas with abundant game populations. The FWC located regions with the appropriate game populations, and developed a method where applicants pay $5 for the chance to spend from $35 to $175 for a permit to hunt either dove, turkey, deer or hog in a special-opportunity setting.

The FWC is making more permits available for turkey, deer and hog hunters during the 2000-2001 season.

The hunters were true to their words. Last year 1,533 applications were submitted for 376 special-opportunity turkey hunt permits. The numbers may be misleading though because a hunter can submit more than one application.

"Some hunters are so captivated by the program's success rates they submit 10 or more applications per hunt to boost their chances of getting drawn," said coordinator Eddie White.

"That's fine as long as they submit the $5 non-refundable fee with each application."

Part of the FWC's preparation of a new wildlife management area is to evaluate it for special-opportunity hunts. The number of permits issued is determined by the size of the area, habitat types, special regulations (such as dog hunting vs. still hunting, archery, etc) and accessibility.

"We did not want to remove any WMAs from general hunting to implement special-opportunity hunting," said White. "We still feel that program has lots more room for growth."

The FWC is making more permits available for turkey, deer and hog hunters during the 2000-2001 season. The number of spring turkey permits available is 546 and there are 910 permits available for various hunts of hogs and deer. The 1999-2000 season offered 376 turkey permits and 560 permits for a variety of hog and deer hunts.

A special-opportunity hunt creates a private-hunt experience on public land. Under the special-opportunity program a deer hunter at Green Swamp-West Unit will, theoretically, have 636 acres to roam for game. At the nearby Green Swamp WMA, which is not part of the special-opportunity program, permits average out to one hunter per 66 acres. The same calculations place one deer hunter per 62 acres at Richloam.

The figures are about the same for spring turkey hunts. A special-opportunity hunter at Green Swamp-West gets 636 acres, a regular hunter at Green Swamp gets 250 acres and at Richloam 224 acres. The trend holds up across the state.

Some people, like James Moore, enjoy having the space to be alone in the woods. For them, a special-opportunity is a more enjoyable way to pursue the sport. When there are fewer people in the woods it is quieter, safer and there's more chance for success. It's an added benefit that the application and permit fees raises money for programs that benefit hunters and wildlife. The attraction is the solitude of the wild.

Stephen R. Kellert's research offers some insight as to why this is so. Kellert, a professor at Yale, has studied human beings place in the natural world and believes people have an innate need to commune with nature. He wrote in the *The Biophilia Hypothes* that ". . . the illusion that people no longer require intimate relationships with the living world . . . (is) one of the major traumas of the modern era."

That sentiment is echoed by James Moore. Moore has gone on three special opportunity hunts with a teenage son. During those excursions they bagged turkeys and a hog and used the time to discuss life at a deeper level.

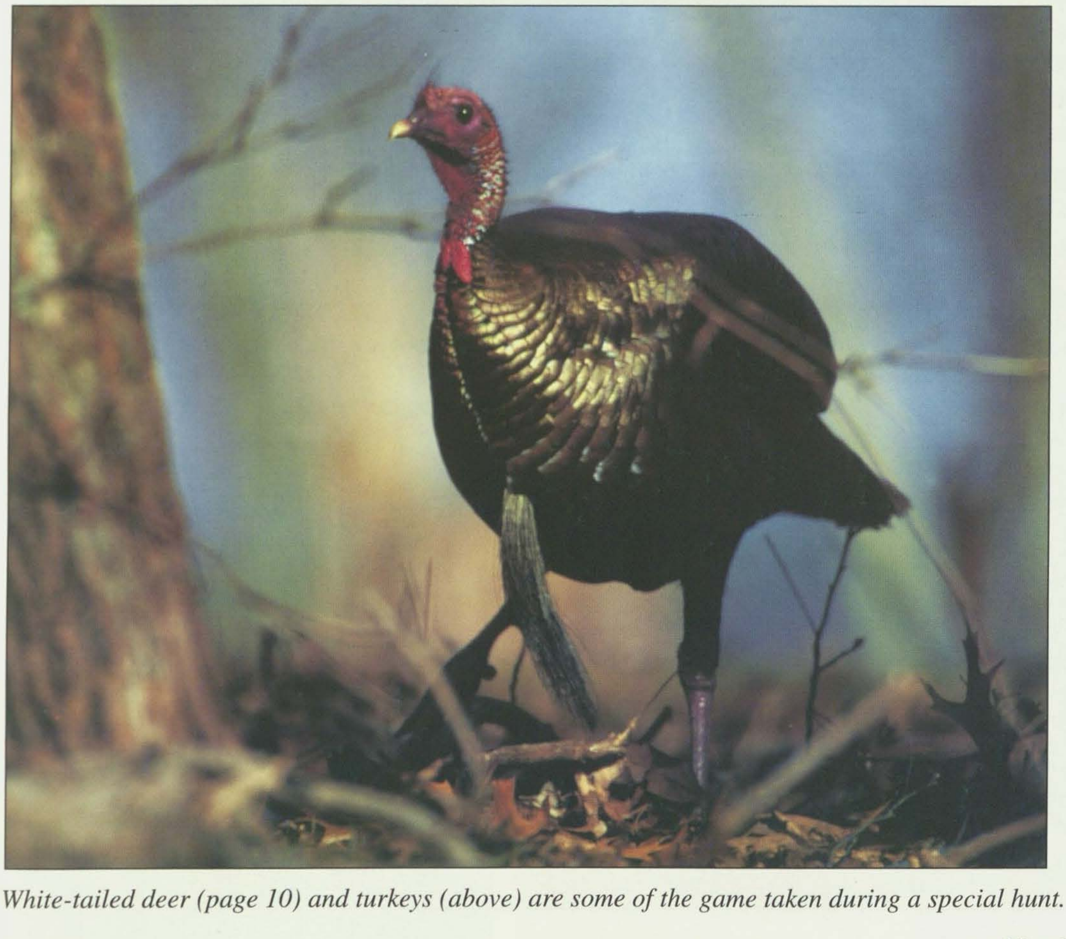
"My cathedral is a cypress swamp," said Moore. "That is where I commune with my god. It is there where we strengthen our heart. In learning the respect in taking a life, you learn respect for wildlife. You are just as happy to watch it go by as you are in taking a life. There comes a time for the harvest. The end of life is a part of life."

The FWC's White believes the program has been successful in offering the type of hunting experience people said they wanted. In 1998 turkey hunters posted a 61-percent success rate in bagging a turkey. Dove hunters an 80-percent success rate, hog hunters 69-percent and deer hunters scored a 92-percent success rate. Twenty-five percent of the deer had at least four-point antlers on at least one side. Also, James Stovall of Lakeland took a state record buck as a special-opportunity hunter.

A random drawing among applications received in the Tallahassee office of the FWC before the deadline of 4:30 p.m. June 15 will award the right to purchase a special opportunity permit for the 2000-2001 season. The hunts will be held at nine wildlife management areas. Scheduled are one deer hunt, 14 deer & hog hunts, two hog dog hunts, two hog still hunts, six hog hunts and 37 for spring turkey.

Applicants should receive a special-opportunity permit invoice or rejection notice within two weeks after the deadline. For more information call (850) 488-3831.

James Call is the associate editor of Florida Wildlife.



Tom Evans

White-tailed deer (page 10) and turkeys (above) are some of the game taken during a special hunt.

Five Tips for Catching Bass

The largemouth bass, found statewide, is the best known and most popular freshwater game fish in Florida. Here are some bait tips to help you land a lunker.

Largemouth bass by Doug Stamm

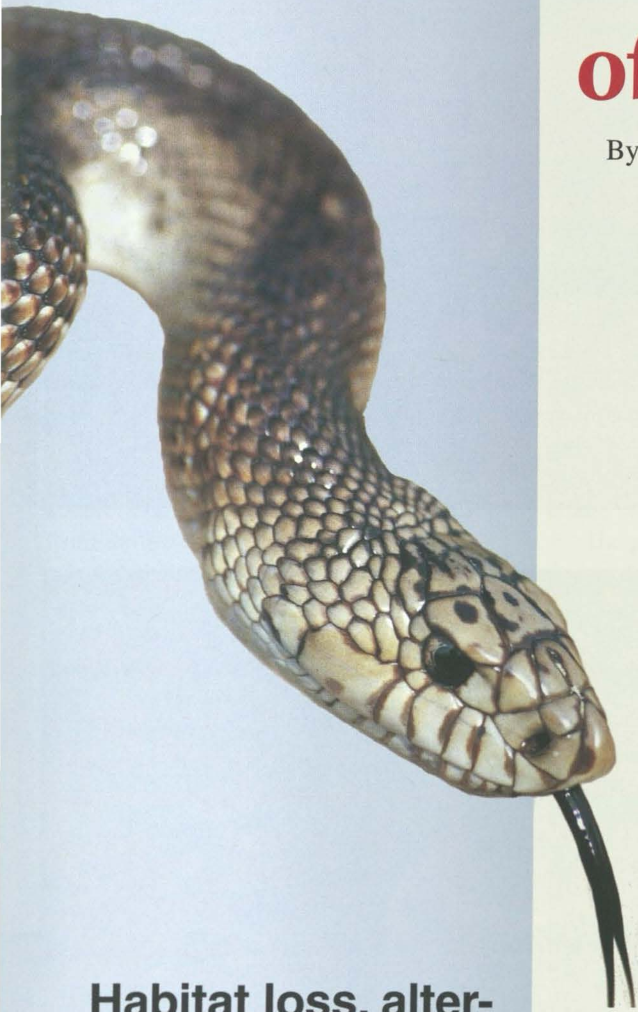
1. The best live bait is a golden shiner, under a float or free-lined.
2. The plastic worm is the most dependable artificial bait for largemouth bass. A weedless "Texas" or "Carolina-rigged" worm is effective when fishing lakes with heavy plant cover.
3. Jerk baits are helpful when there's dense underwater vegetation. Rigged without sinkers, jiggle the bait rapidly over vegetation, with brief pauses to let it sink slowly.
4. A steady retrieve of crank baits is an effective method when fishing in deeper water.
5. Top-water baits are an exciting choice because you can see the strike. Top-water plugs that imitate wounded bait fish may be retrieved rapidly or twitched to entice bass.

Bonus Tip: If you are fishing to catch and release, remember to lift the bass vertically from the water. When lifting a bass horizontally, with a thumb inside the lower jaw, all the bass' weight is supported by the jaw. This may dislocate the jaw and the fish will be unable to eat and will starve once it is released.

Point your browser to **www.state.fl.us/fwc/** and follow the fishing link to learn more about fishing Florida. To order your fishing license 24 hours a day, call toll-free 1-888-FISH-FLORIDA (1-888-347-4356).

Nonvenomous Snakes of Florida

By D. Bruce Means, Ph.D.



When I first came to live in Florida in 1960, the indigo snake was common around Homestead, the Florida kingsnake was abundant along U.S. 441 through Payne's Prairie south of Gainesville, and hundreds of watersnakes slithered out of the Everglades across U.S. Highway 27 between Hialeah and Belle Glade during heavy summer rains. In the late 1960s I discovered the patternless morph of the common kingsnake between the Ochlockonee and Apalachicola rivers and over a four-year period collected data on about 20 such kingsnakes there. And in sandhills habitats near Tallahassee, I encountered many examples of the southern hognose snake.

Today, 40 years later, the indigo snake is a federally threatened species, missing from most of its original Florida range. The common kingsnake seems to be practically extinct on Payne's Prairie as well as many other places in the state – I haven't seen one in hundreds of man-hours afield in the Apalachicola National Forest, for instance. And mass movements of water snakes are practically nonexistent across most of south Florida's major highways. Previously common snakes, such as the southern hognose snake, have become so rare that herpetologists have wondered in print about what has happened to them. ▷

Habitat loss, alteration and fragmentation are the worst culprits in the demise of all of Florida's fauna, but for snakes there is another menace: people generally do not appreciate them.

Page 13 photos by D. Bruce Means

Above: indigo snake
Top left: pine snake

The answer, of course, is a growing human population and its effects on animals of all kinds. In 1960 there were five million people in the Sunshine State. Today, there are more than 15 million folks living here and more moving into the state every day. Habitat loss, alteration and fragmentation are the worst culprits in the demise of all of Florida's fauna, but for snakes there is another menace: people generally do not appreciate them. It is not uncommon to see a pick-up truck or automobile pulled half off the road while the owner blasts away at a snake with a pistol, rifle or shotgun. And I have been behind other vehicles that deliberately swerved to kill a hapless snake crossing the road, no matter whether it was harmless or not.

Snakes are important members of the communities in which they live, performing valuable ecological services. All are carnivores. They eat rodents, insects, earthworms, crayfish, fishes and a few birds. In turn they provide food for bobcats, hawks, owls, raccoons, the Florida panther, black bears, storks, herons, other snakes and even humans, to name a few. And Florida, more than any other state, is richly endowed with them. A whopping 45 species call Florida home (44 natives and one exotic).

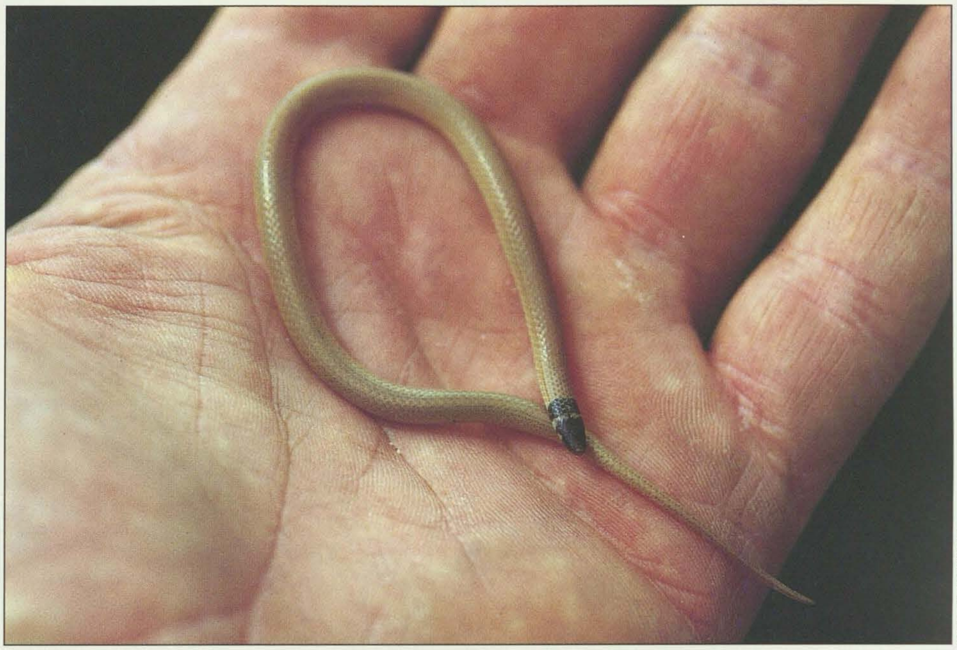
Only six of Florida's snakes (13-percent) are venomous (see the September/October 1999 issue of *Florida Wildlife*). Except for the introduced Brahminy blind snake, all the rest are nonvenomous species belonging to a single snake family, the *Colubridae*. Snakes are long, tubular reptiles with dry, scaly skin. Their kin are turtles, crocodilians and lizards – from which snakes are thought to have evolved, except that snakes have generally lost their legs (boas and pythons have tiny vestiges). Being legless has not prevented them from mastering all forms of locomotion, however. Some burrow in the ground, all are consummate swimmers, many climb in bushes and vegetation and the rat snakes can go straight up a pine tree. In southeast Asia, a few even can glide!

Florida's snakes are diverse. A few, such as the crowned and earth snakes, are tiny animals no bigger than a large earthworm. Others may be longer than a man is tall, up to eight feet in the case of the indigo snake. They are found in almost every habitat in the state, from salt marshes and barrier islands to longleaf pine sandhills and flatwoods, river bottomlands, and in the waters of lakes and streams from Pensacola to Key West. Some prey almost exclusively upon crayfish, some lust for eels, some hunt birds and rodents, while others specialize in feeding on other snakes. Nonvenomous snakes are about equally divided between those that lay eggs in the ground and others that give live birth.

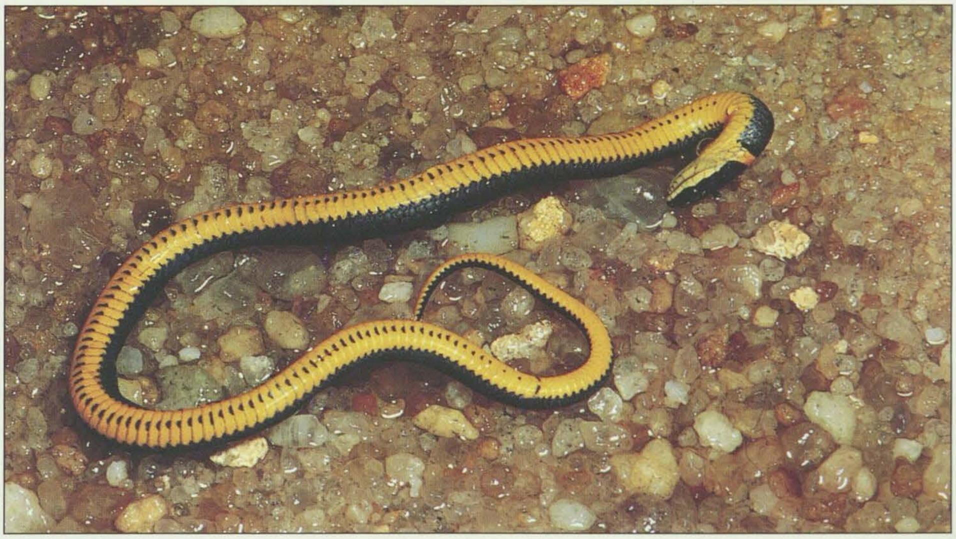
The future of Florida's snakes in the next century is grim. With the state's human population so large and growing rapidly, more habitat will be lost and fragmented. More pollution and heavier highway traffic is assured. One hundred years from now you may have to visit a snake park or publicly owned lands just to see a snake. And what can be done about snakes' negative image? Try our best to stimulate a better informed public. Here we present a few color photographs and some text about them.

They are a fascinating group of unique animals that share the planet with us. They possess no malevolence for humans. Maybe they deserve a second look.

Commonly snakes are grouped by their relationships, such as rat snakes, water snakes, kingsnakes and so forth. Below, the nonvenomous snakes are discussed by the habitats in which they live.


D. Bruce Means

Crowned snake


D. Bruce Means

The underside of a ringneck snake

Snakes In Or Near Water

No less than 15, or one-third, of Florida's snakes can be found in or near water. You might occasionally be startled to spot an eastern diamondback rattlesnake or some other snake swimming out to sea, but no true sea snakes are found in the salt waters of the state. The first snake you should expect to encounter as you come inland from the sea, is the **salt marsh snake**. This species is found in brackish and salt water tidal estuaries and salt grass meadows around the margins of the state from Pensacola to about Daytona Beach. The salt marsh snake comes in a wide variety of color patterns. Along the Gulf Coast it is boldly marked with black and gray stripes. In the mangroves of the southern half of the peninsula, it ranges from uniformly reddish brown to dark gray, often with a hint of darker blotches on its side. And a group of populations along the Atlantic Coast having stripes on the first half of their bodies and blotches on the rear half are considered threatened. Salt marsh snakes feed largely upon species of small fish that inhabit salt marshes.

Salt marsh snakes are members of the genus *Nerodia* to which most of Florida's large (24-48 inches in total length) water snakes belong. In rivers of the Florida panhandle boaters commonly mistake for the cottonmouth the brown water snake coiled or draped in the bushes overhanging the bank. This snake is the one that most frequently drops into the water. Dappled with different shades of brown color, the brown water snake is a pretty good facsimile of the cottonmouth, but its diet is principally fish and frogs and it is unable to deliver a venomous bite. In the Florida panhandle this species is mainly found along riverbanks and in cypress swamps and waterways in river bottomlands, but down the peninsula, the **brown water snake** is also found in canals, swamps and ponds.

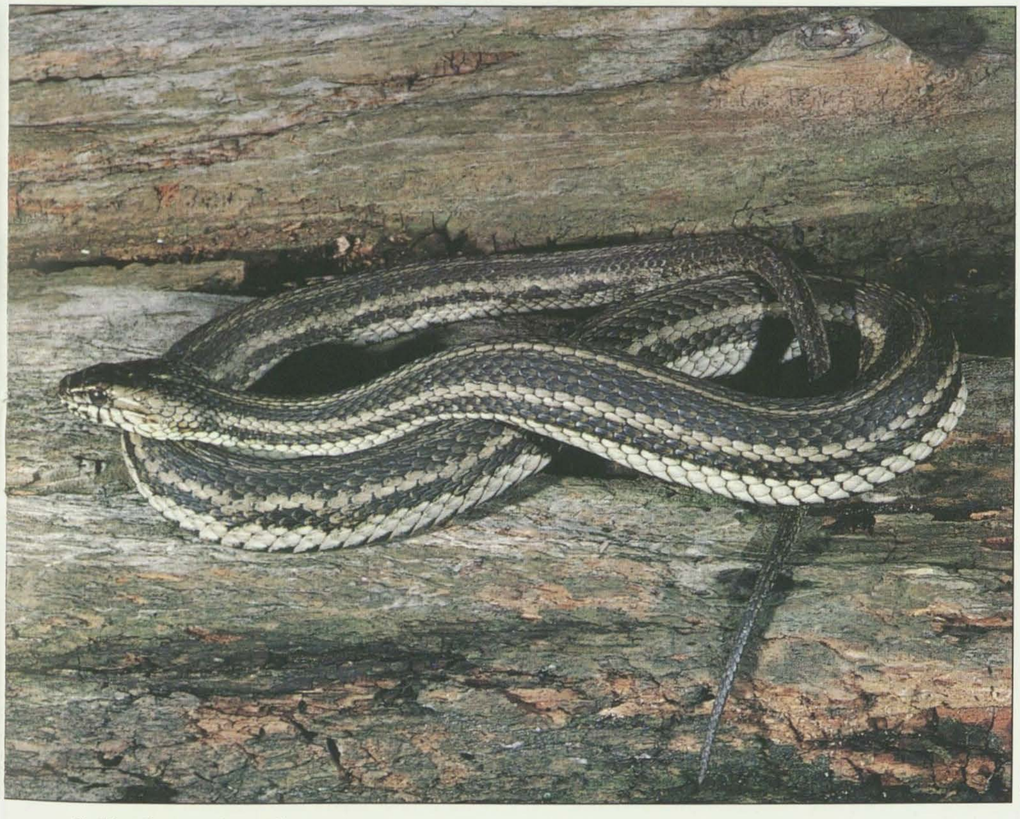
The **green water snake** is an inhabitant mostly of open wetlands with lots of emergent vegetation such as the Everglades, marshes along the St. John's River, large lakes, and wet sawgrass prairies. Its diet consists of frogs, fish, salamanders, and tadpoles. Its coloration is uniformly dark olive green, often with a speckling of darker pigment.

In contrast with the green water snake, the **red-bellied water snake** is uniformly reddish brown above, but either bright yellow or orange-red below and it is only found in north Florida from the Suwannee River westward. It lives mainly in and around waters of rivers, streams and small creeks that drain into them, and it feeds upon fishes and frogs.

The **banded water snake** is probably Florida's most ubiquitous water snake. Found in almost any freshwater habitat and often moving across roads in search of new territory, the banded water snake is also the most commonly encountered snake in Florida. Like other *Nerodia*, it feeds on frogs and fish, and tadpoles and large salamander larvae when it can get them.

Related to the banded water snake, which it closely resembles in color pattern, natural history and behavior, is the **midland water snake**. It is found only in far western Florida from the Yellow River westward.

Three closely related snakes are feeding specialists on crayfishes. The Gulf and striped crayfish snakes have very smooth, glossy scales, the **Gulf crayfish snake** being uniformly ▷



D. Bruce Means

Gulf salt marsh snake

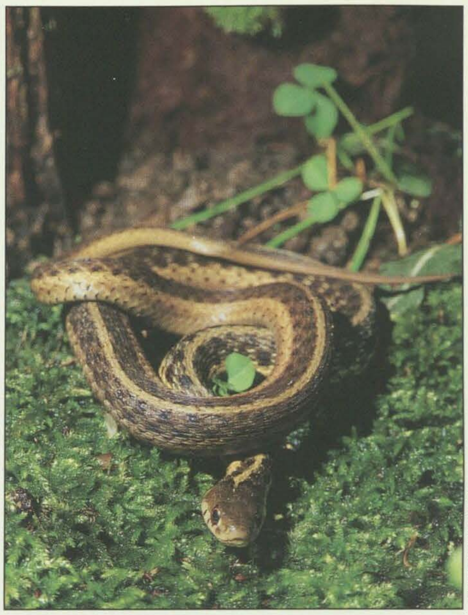
Brown water snake

chocolate or olive brown on the back with two parallel rows of dense black dots down a tan belly. The striped crayfish snake lives in densely vegetated aquatic habitats such as hyacinth-choked canals and the margins of swampy lakes. It has basically the same color pattern except that the pigment is aligned in light and dark olive brown stripes and the snake has a plain tan belly. The related queen snake is more slender than the other two species, lives in Florida only in the panhandle, has duller, obviously more keeled scales and a prominent light tan stripe from the lips all the way down the body. These are medium-sized snakes, 24 to 36 inches long, that are so secretive that they are rarely seen.

Two others, the garter and ribbon snakes, are medium-sized snakes found mostly near water, but also are frequent visitors of most upland habitats including pine flatwoods, hardwood forests, river bottomlands, prairies and human-disturbed sites. Both garter and ribbon snakes come in a variety of color patterns, but both are active daytime snakes with a relatively large eye, white or sometimes blue color on the lips, and have keeled scales and a dark brown to black color pattern usually with two or three bold light stripes. The **garter snake** is more robust than the more slender **ribbon snake**. Both are opportunists feeding on nearly anything they can overpower, but usually earthworms, small fish, frogs, toads, tadpoles and other aquatic and semi-aquatic creatures.

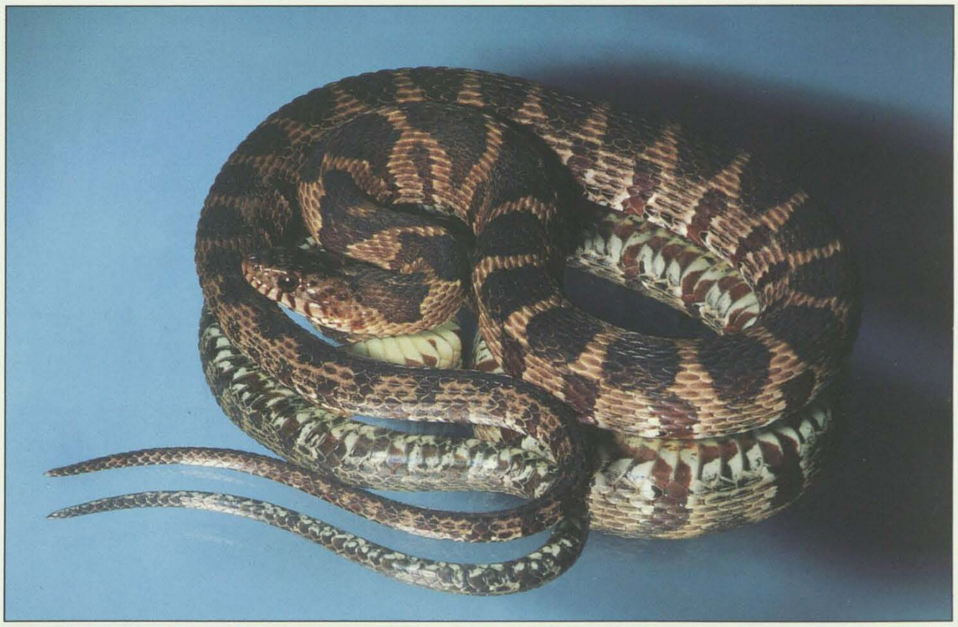
The mud and rainbow snakes are among Florida's most beautiful snakes, both having smooth, shiny scales looking just like patent leather. They are large, stout snakes that hunt at night for unusual prey. The **mud snake** favors large, elongate, salamanders-sirens and amphiumas – and the rainbow snake almost exclusively eats eels. Both have powerful jaws and strong teeth for gripping their slippery prey, but neither offers to bite when handled. The mud snake is coal black with bright red triangles coming up along its sides from the entirely red belly. The **rainbow snake** is coal black but has three bright red stripes down its back and a yellow and red belly. They are both highly aquatic, tending to remain submerged except for an occasional breath, and only leave the water to find new habitat or to lay eggs.

Mud and rainbow snakes are Florida's only aquatic snakes that lay eggs. All other aquatic snakes give live birth. Also, while most terrestrial snakes lay eggs, these two species are the only Florida snakes that stay coiled around their eggs while the eggs develop. This is done in shallow chambers in moist soil. Because of this habit, the mud snake was once called the hoop snake, and fanciful tales of hoop snakes coiled and rolling with their tails in their mouths were once common folklore. The tails of both snakes are the source of another legend about them, and another nickname, the horn or stinging snake. Because their tail tapers



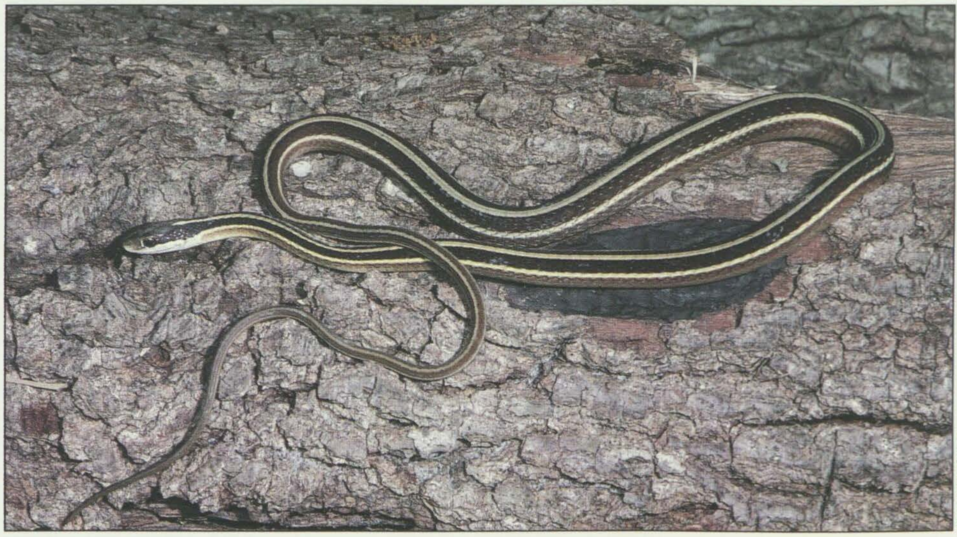
William J. Weber

Common garter snake



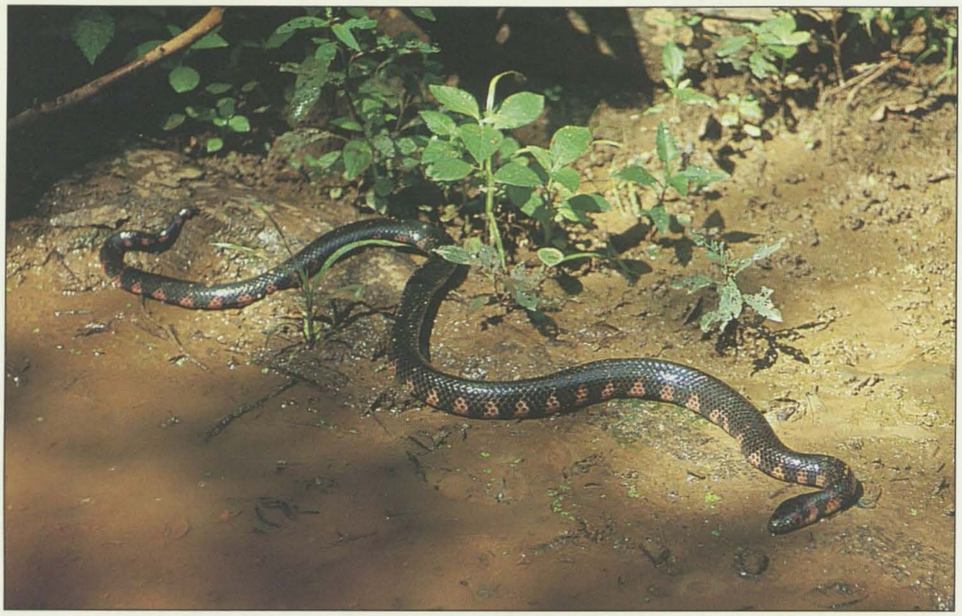
D. Bruce Means

The mirror exposes the underside colors of the northern banded water snake.



Barry Mansell

Ribbon snake


D. Bruce Means

Mud snake

rapidly to a sharp point, it was believed to deliver a venomous sting, but that is not true.

Finally, the small **swamp snake**, 10-15 inches long, appears to be abundant in spite of the fact that it is rarely seen by the lay person. Living in lakes, ponds, canals, cypress sloughs and swamps, it is glossy black with a red belly and eats a variety of aquatic invertebrates, small fish, tadpoles and the like.

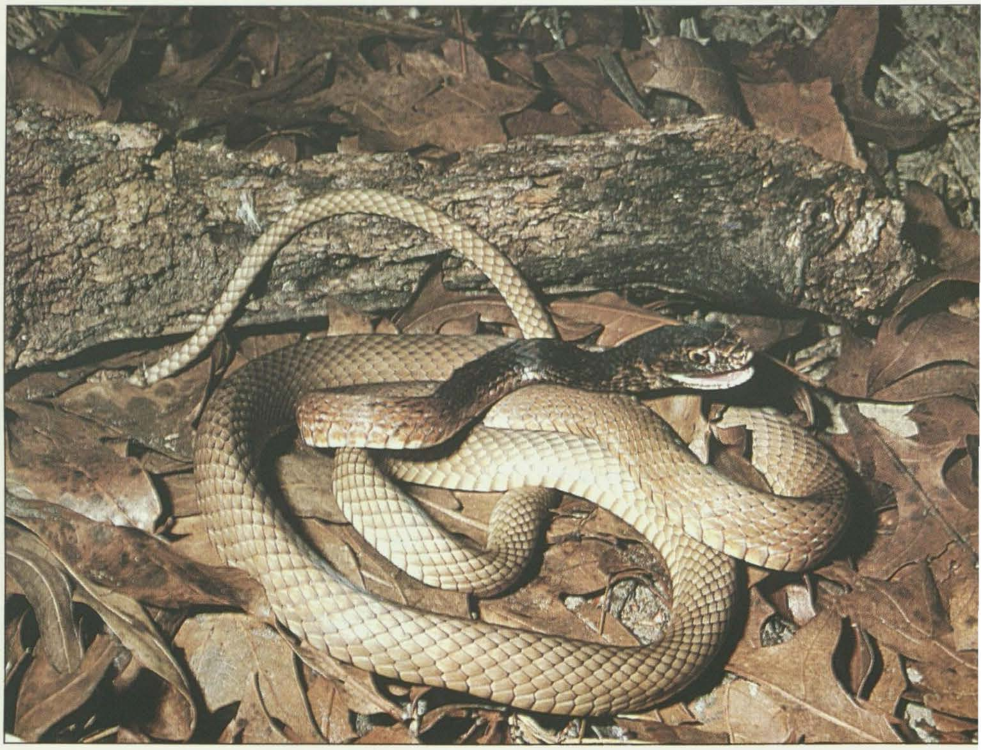
Large Terrestrial Snakes

Florida has eight species of ground-dwelling nonvenomous snakes that average over three feet in length, some with maximum lengths approaching 8 feet. The longest snake in the U. S. and Canada is the federally threatened indigo snake, for which records over 8 feet are known. Averaging 60-72 inches in length, the **indigo snake** is a regal-appearing, jet black, heavy bodied snake that will hiss, vibrate its tail, and rise up and flatten its neck when cornered in an attempt to frighten potential enemies. If you call its bluff and catch it, however, it rarely attempts to bite, yet it is possessed with a battery of very strong teeth. With these it captures and literally shreds the heads of its favorite food: other snakes, although the indigo snake will overpower and eat almost any animal it can handle, including small turtles.

Most snakes are relatively slow-moving, but the **black racer** and **coachwhip** are the cheetahs of the Florida snake world. Both have large, forward-directed eyes with good binocular vision that assists them in chasing moving prey such as lizards, mice and birds. The coachwhip lives up to its name by resembling a braided whip of straw color with a black handle. It can grow to nearly eight feet long and prefers open habitats with herbaceous groundcover. It is not a species of brushland or forests. Because its native longleaf pine habitat has diminished dramatically and abandoned agricultural fields are not so common as early in this century, the coachwhip is not so readily seen any more.

The black racer, or blacksnake, on the other hand, is Florida's most frequently encountered large snake. Black or slate gray with a white chin (occasionally light brown), the 36-60-inch-long black racer can be confused only with the indigo snake, which is distinguished by its red chin and larger size, and the black variety of the pine snake found in far western panhandle Florida, which has a strongly pointed snout and a hint of blotches on the rear half of the body.

Florida has three kingsnakes that do not resemble each other at all. And to make matters more confusing, the largest, the common **kingsnake**, is highly variable from one end of the state to the other. Usually 36-48 inches long, the common kingsnake in north Florida is coal black with less than 30 white or yellow crossbands. Going down the Florida peninsula, these kingsnakes become lighter in overall color and the number of light crossbands increases to more than 40. In the lower Apalachicola River valley and in south Florida, all yellow patternless individuals are found occasionally. The common kingsnake kills its prey by constriction, coiling around its prey and suffocating it. Lizards, frogs, bird's eggs, ▷


Barry Mansell

Eastern coachwhip

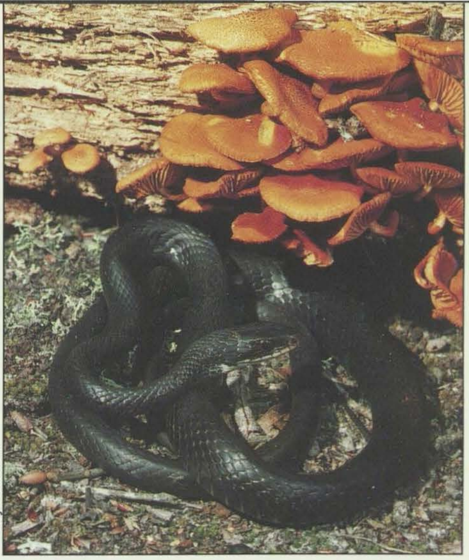
rodents and other snakes are its favorite fare.

Less commonly seen, but coveted by snake hobbyists, is the colorful **scarlet kingsnake**, a small species only about 14 to 20 inches long. This tiny constrictor feeds upon lizards and other tiny snakes. It is most famous as a mimic of the coral snake, having bold black, white, and red crossbands, but the scarlet kingsnake can be identified by its red nose and the fact that its red and yellow bands do not touch but are separated by the black bands. One of Florida's rarest snakes is the secretive **mole kingsnake** of 30-40 inches in length. In body build and color pattern it closely resembles the corn snake, having orange-red blotches along the midline of the back on a lighter orange general color. It is a constrictor, but so few in Florida have been seen that little knowledge is available about what it eats or what it does. One race is found in the Florida panhandle west of the Ochlockonee River and another appears to be isolated on the Florida peninsula in a small area north of Lake Okeechobee.

Probably Florida's most endearing snakes are two species formally called **hognose** snakes, but locally known as "spreading adders". With upturned noses for shoveling toads, their favorite food, out of the ground, hognose snakes have a famous repertoire of behaviors designed to discourage predators. When first alarmed, they rear up like a cobra and spread their necks to create the illusion that they are larger than they really are. They strike and hiss while in this posture, but if you put your hand in striking range, their noses only bounce off your hand because they do not bite. Upon further threat, they then roll over on their backs and wipe smelly feces and glandular secretions all over themselves to ruin the appetite of their predators. To make the death sham complete, they hold their mouths open, let their tongue dangle out and even bleed from the tissues of the mouth. While in this "catatonic" state, you can turn one right side up and it will comically quickly flip over on its back again.

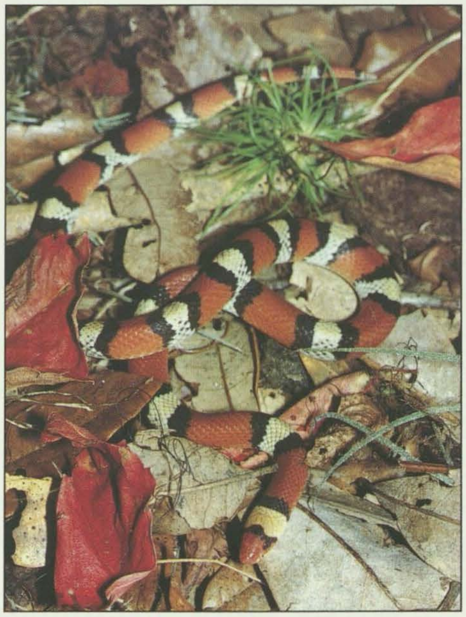
The eastern is more common than the southern hognose, occurring in all sorts of natural pinelands, hardwood hammocks and sandy soils. It comes in coal black or black and yellow checkered or mottled patterns. The southern hognose snake has a more sharply upturned snout and is red and black checkered on a light gray background color. Unfortunately for its long-term survival, it depends upon Florida's dry, sandy habitats for its living space – which is the most attractive habitat for humans.

The **pine snake**, like the southern hognose snake, is declining for the same reason: it likes sandhills. This is a large (36-60 inches) freckled snake having tan

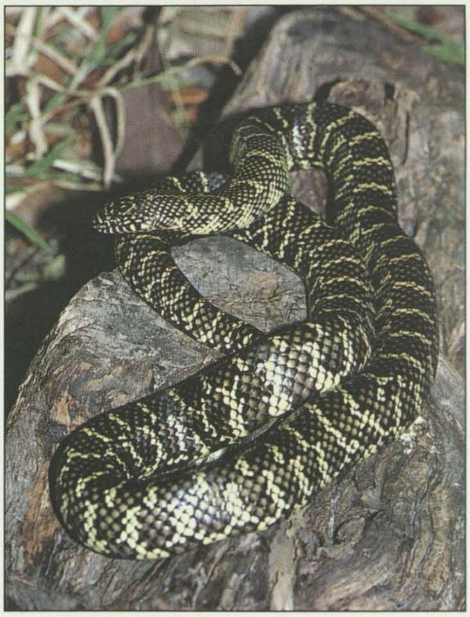


Barry Mansell

Southern black racer

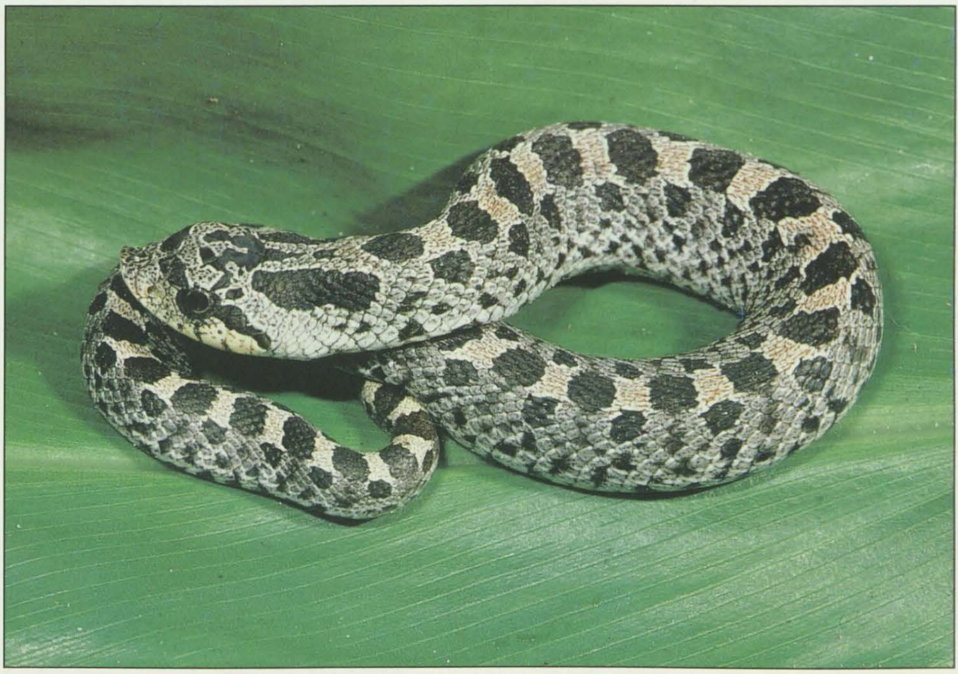


Scarlet kingsnake



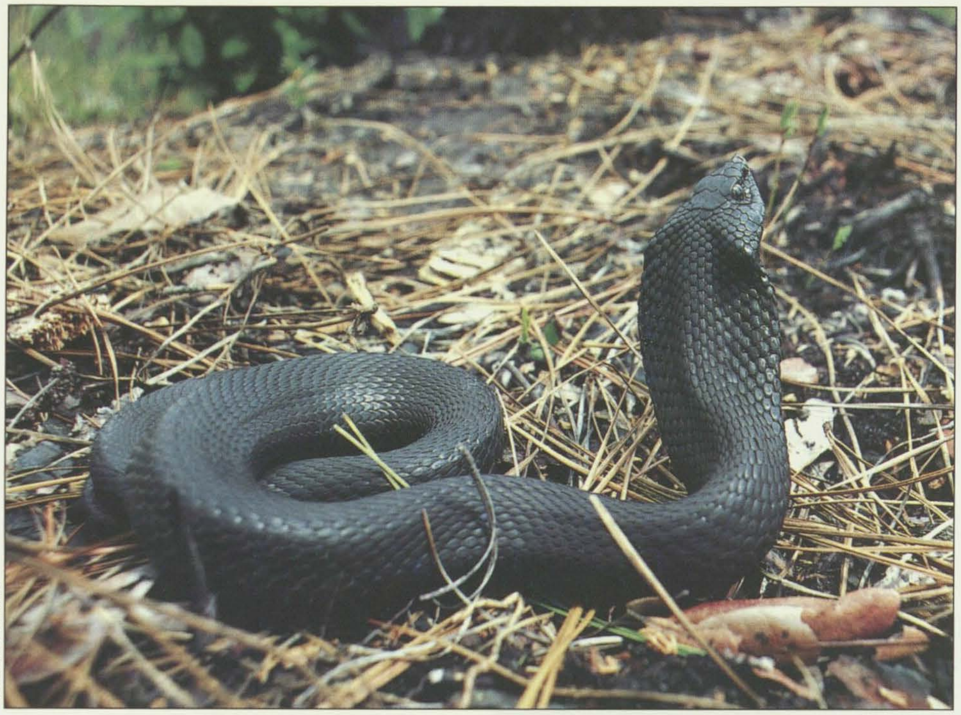
kingsnakes by Lynn Stone

Florida kingsnake



Barry Mansell

Southern hognose snake



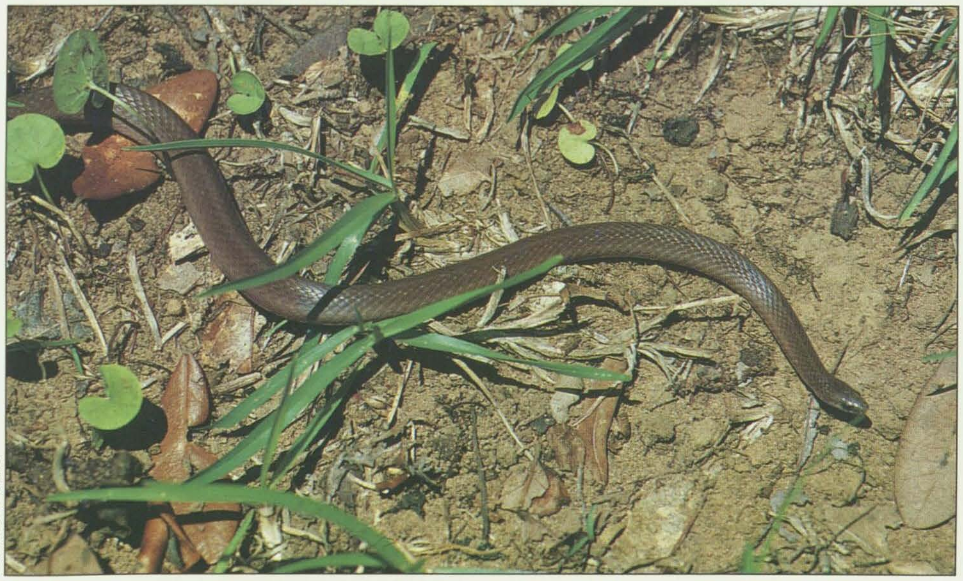
D. Bruce Means

An Eastern hognose snake. Notice the difference in pattern compared to the Southern hognose on page 18.

or cream colored scales on its head and first one-third of its body. This becomes a pattern of dark brown blotches in mid-body that grade into rusty brown blotches on the tail. It has a decidedly pointed snout that it uses to push itself into soft sandy soil to find the pocket gopher, a burrowing rodent, and one of its major foods. Rodents, birds and bird eggs make up its menu. These handsome snakes have a cartilage on their windpipe that helps them emit a loud, hollow-sounding hiss when frightened.

Small Terrestrial Snakes

About ten of Florida's nonvenomous snakes are small, less than about 18 inches long. In north Florida, besides the ubiquitous black racer, the **smooth earth snake** is the most commonly seen snake by humans. This is a small, uniformly light brown snake that looks very much like the animals it eats, earthworms. It also feeds upon a few snails, slugs and insects, and is the snake most likely to be found in suburban and sometimes even urban settings. It thrives in loose soil in back yards, gardens and around ornamental plants. A close relative, the **rough earth snake**, has about the same distribution and looks about the same. The brown, redbelly and pine woods snakes all look alike and are similar to the earth snakes, but are usually found in native pineland habitats.



D. Bruce Means

Smooth earth snake

Three species of **crowned snakes** are distributed patchily throughout Florida. Straw colored, they are identified by a black head and neck that sometimes are separated by a white ring. They are uncommonly seen everywhere except in the sandy highlands of the Florida peninsula.

The ringneck and scarlet snakes are easy to identify. The former is slate gray with a bright yellow-orange ring around its neck. Its belly is bright yellow-orange and has a double row of small black dots. It eats earthworms and slugs and, to a lesser degree, small lizards, salamanders, and tiny frogs. It is found in hardwood forests and moist pine flatwoods. The scarlet snake is another mimic of the coral snake, but its white bands do not touch the red ones, which are separated by black bands. It has a plain white belly. Found all over the state in pine forests and mixed pine/hardwood habitats, the scarlet snake has a peculiar habit of feeding mainly upon reptile eggs.

Tree Climbers and House Visitors

Almost invariably, when a snake gets into someone's house, it is one of the several varieties of the **rat snake** called gray rat snake in north Florida, yellow rat snake in peninsular Florida or Everglades rat snake near the Everglades. This is a single species having marked geographic variation throughout its range in eastern North America. Locally the gray rat snake is called the whiteoak or oak snake, and the yellow rat snake is sometimes called the chicken snake. The local common names tell us a lot about the habits of this remarkable species. It is highly prone to climb and especially fond of eggs, birds and nestlings, with a sweet tooth for rodents, too. It is the most common snake found robbing chicken nests, and most likely to be in your house because of its tree-climbing habits.

The gray rat snake is light gray in color with darker, usually squarish, blotches down the midline of the back

▷

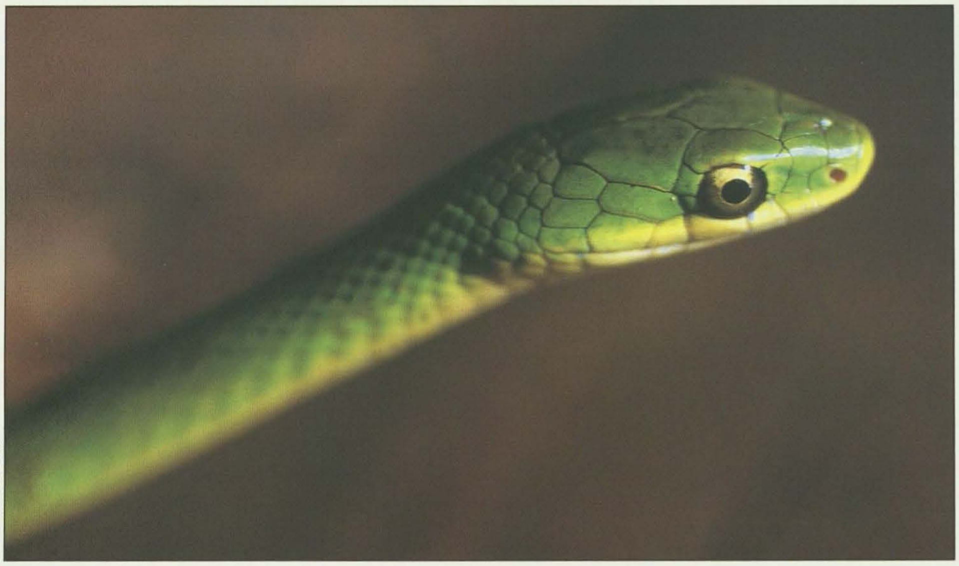
and on the sides. The yellow rat snake is yellow with a pair of faint gray stripes down its back. The Everglades rat snake is yellow orange and may have a hint of stripes or blotches. All races are long, skinny, supple snakes with a cross-section like that of a tire. Whereas most snakes are round in cross-section, these snakes are sharply angled where their belly meets their sides resulting in a prominent ridge along both sides of the lower body. This ridge assists the snake in climbing by allowing individual scales to be placed in the minute nooks and crannies of tree bark. Moreover, the supple body and tail are quite prehensile, readily wrapping around any object to gain a hold.

The red rat snake, more commonly known as the corn snake, challenges the beautiful serpent. It has warm, dark orange, squarish blotches on a lighter orange background color. Another effective constrictor like its cousin the gray rat snake, the corn snake spends a great deal of its time underground searching out rodents, rather than climbing trees. It is capable of climbing, though, and is often found in trees, rafters, the walls of abandoned buildings, and under bridges.

Finally there is the **green snake** that is so adapted for life off the ground that it is mainly found in bushes and thick vegetation where it forages mainly for insects. This slender ribbon of a snake used to be one of Florida's more common snakes, but for some unknown reason, it has disappeared or become very rare in most places. Ask any Floridian who grew up in this state in the 1930s to 1950s about the green snake, and he or she will tell you this species used to be abundant but now you never see one.

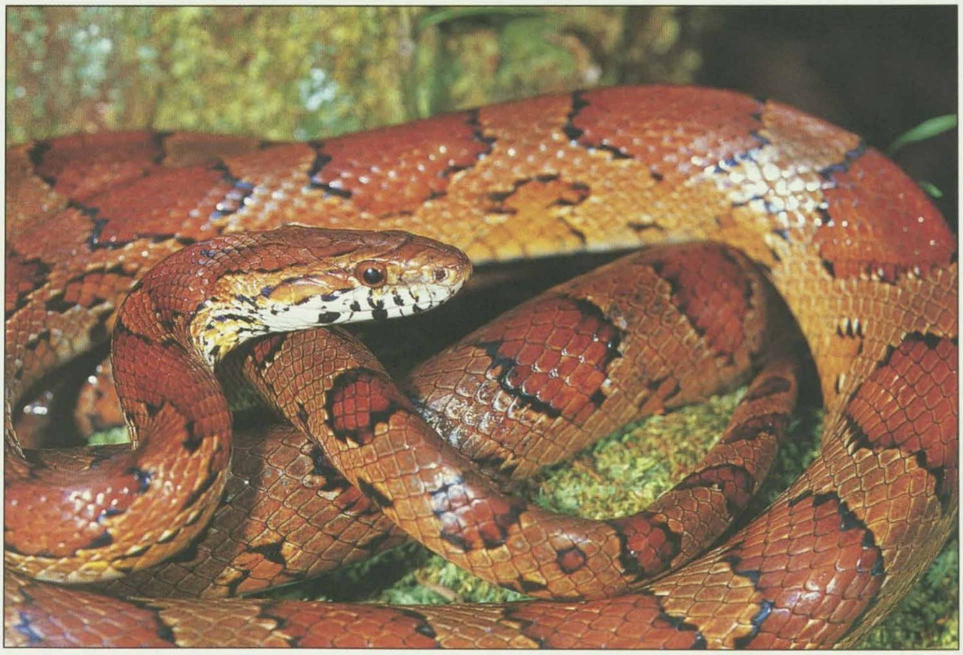
With so many snakes in Florida, the good news is that only a small number are venomous. By far, most snakes are harmless and serve important roles in the ecosystems they inhabit. Healthy and properly functioning ecosystems are important to us. If we aspire to keep any native ecosystems for our pleasure and for the overall health of the planet, we must also allow snakes to survive as part of the biological wealth of our richly endowed state.

D. Bruce Means, Ph.D., of the Coastal Plains Institute and Land Conservancy in Tallahassee is a frequent contributor to Florida Wildlife.



D. Bruce Means

Green snake



Barry Mansell

A red rat snake or corn snake

Guide Books to Florida's Snakes

A Field Guide to Snakes of Florida (Field Guide Series), by Alan Tennant and Kenneth L. Krysko (Gulf Publishing Company, Houston, 1997, ISBN: 0-87719-291X).

Snakes of North America: Eastern and Central Regions (Field Guide Series), by Alan Tennant, Richard D. Bartlett, Gerald T. Salmon (Gulf Publishing Company, Houston, 1999, ISBN: 0-87719-307X).

A Field Guide to Reptiles & Amphibians: Eastern and Central North America, (Peterson Field Guides), by Roger Conant, Joseph T. Collins, Isabelle Hunt Conant (Houghton Mifflin Co, Boston, 1998, ISBN: 0-39590-4528).

Handbook of Reptiles and Amphibians of Florida: The Snakes, by Ray E. Ashton, Patricia Sawyer Ashton, Sandra Romashko (Editor) (Windward Publishing Company, Miami, 1988, ISBN: 0-89317-033X).

Wildlife Friend:

Kissimmee River Valley Sportsman Association

By James Call

Word spread quickly in the Spring of 1988. Central Florida outdoor enthusiasts wondered what would happen to the land where they hunted, fished, birded and camped. The South Florida Water Management District (SFWMD) was buying thousand of acres of land to restore the Kissimmee River. Would the public be allowed to use this land as it had in the past?

That was the question that led to the formation of the Kissimmee River Valley Sportsman Association, Inc. (KRVSA). "We were concerned about what kind of activities would be permitted on the land," said Jerry C. Renney, Jr., president of KRVSA. "We wanted an organized voice to work with the restoration project and influence public policy about land use."

The Kissimmee River begins south of Orlando and flows to Lake Okeechobee. Before it was channelized in the 1970s it meandered along a route of about 100 miles. But flood control measures reduced it to a 56-mile canal. Now a multi agency project is restoring approximately 25 miles of the original Kissimmee River channel and more than 25 square miles of associated flood plain wetlands. The total project involves more than 60,000 acres (93.75 square miles).

"They're very enthusiastic and concerned about protecting their rights to navigate boats and hunt on public lands," said Jay Udelhoven, Regional Land Manager for SFWMD.

"They're involved in creating public use rules. Sometimes they do not agree with the stand the district takes. But we still have a very cooperative relationship," said Udelhoven.

KRVSA serves as a link between government agencies and outdoor enthusiasts on issues of common concern. It also provides the labor to restore property to natural conditions once it becomes public land.

The annual Lake Clean-up demonstrates the impact citizen volunteers can have. At the first clean-up eleven years ago, volunteers hauled 10 tons of trash from the woods. Volunteers collected debris from abandoned hunting and fishing camps, including freezers, refrigerators, fences, pontoons and piles of metal and tin. This past spring about 2 tons of trash was collected.

"There was about 150 years of use out there that was never cleaned up," said Renney.

"As the property is purchased by the district it becomes our responsibility. Thank goodness, the trash is getting harder to find."

Sweat equity from the KRVSA helped the project purchase a large tract of land. State money was available if the district had a plan to control the invasive melaleuca tree. Thirty-three members showed up to chop the exotic plant with machetes and chain saws and to sprinkle herbicide on the stumps.

Renney said the group is always looking for ways to help conserve the environment. That's what led to the adoption of a two-mile section of a road leading into a state park. It started from a discussion about the "Please Don't Litter" signs that Polk County had put up. It ended with KRSVA assuming responsibility for Camp Mack Road, "the gateway" to the Kissimmee Chain of Lakes.

"Over the years we've gotten pretty good at picking up trash," said Renney. "So why not?"

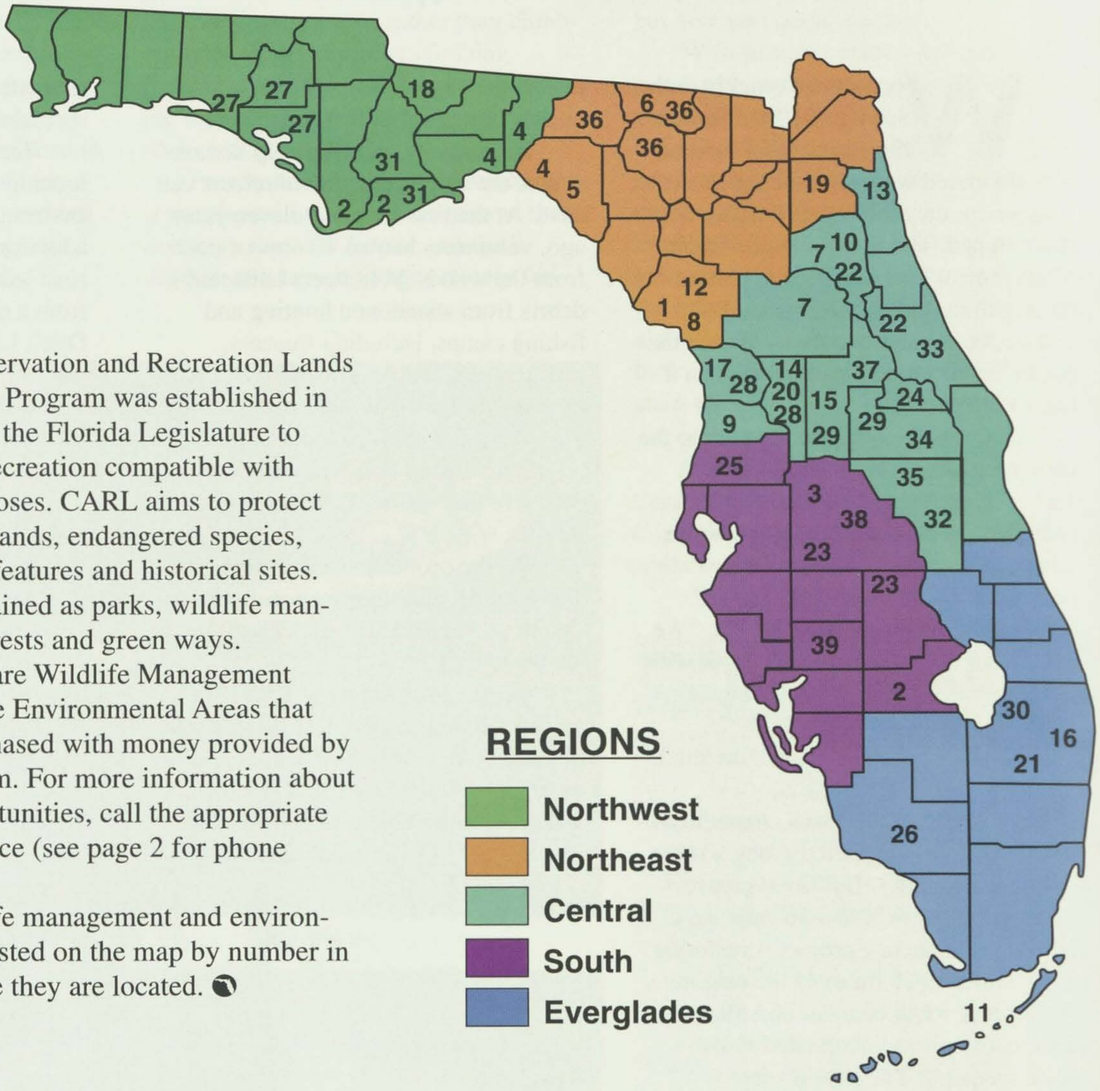
James Call is the associate editor of Florida Wildlife *magazine. You may nominate a Wildlife Friend by contacting James at (850) 488-9463, e-mail callj@gfc.state.fl.us and U.S. mail* Florida Wildlif*e, 620 S. Meridian Street, Tallahassee, Florida 32399-1600.*

Rhonda Moore

Left to right: Ronnie Peterson, Brian Finder, Pat Cochran and (back) Clyde Ware at a melaleuca work day.

CONSERVATION AND RECREATION LANDS

Compiled by James Call



The Conservation and Recreation Lands (CARL) Program was established in 1979 by the Florida Legislature to provide outdoor recreation compatible with conservation purposes. CARL aims to protect natural areas, wetlands, endangered species, unusual geologic features and historical sites. The land is maintained as parks, wildlife management areas, forests and green ways.

Listed below are Wildlife Management Areas and Wildlife Environmental Areas that contain land purchased with money provided by the CARL program. For more information about recreational opportunities, call the appropriate FWC regional office (see page 2 for phone numbers).

Florida wildlife management and environmental areas are listed on the map by number in the counties where they are located.

NAME	COUNTY	REGION	ACREAGE	RECREATION
1. Andrews	Levy	Northeast	3,501	hunting, fishing, hiking
2. Apalachicola River	Franklin, Gulf	Northwest	60,872	hunting, camping, fishing
3. Arbuckle	Polk	South	13,530	hunting, camping, fishing, hiking, horseback riding
4. Aucilla	Jefferson, Taylor, Wakulla	Northeast	77,864	hiking, horseback riding, hunting, fishing
5. Big Bend	Taylor	Northeast	62,147	fishing, horseback riding, hunting
6. Big Shoals	Hamilton	Northeast	3,495	hunting, camping, horseback riding, hiking, fishing
7. Caravelle Ranch	Marion, Putnam	Central	13,383	camping, fishing, hiking, horseback riding, hunting
8. Cedar Key Scrub	Levy	Northeast	4,870	hiking, horseback riding, hunting

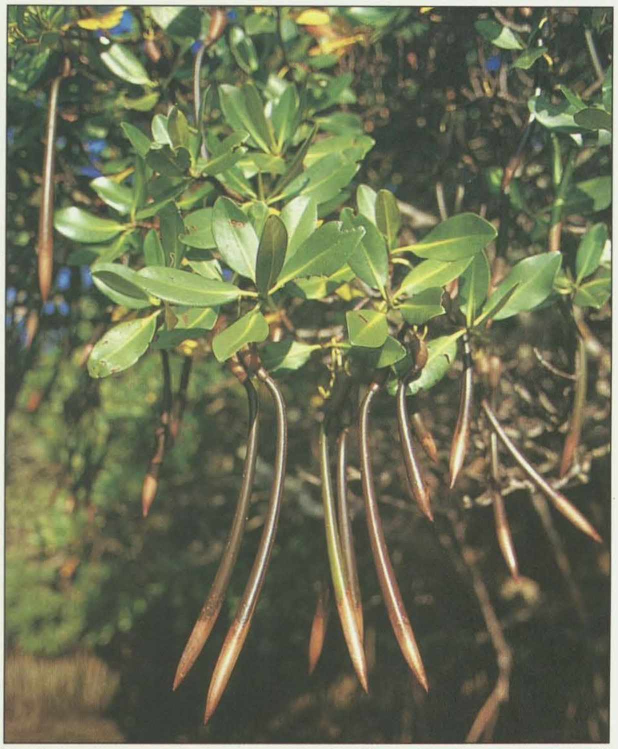
NAME	COUNTY	REGION	ACREAGE	RECREATION
9. Chassahowitzka	Hernando	South	31,453	fishing, horseback riding, hunting
10. Etoniah Creek	Putnam	Central	7,145	fishing, hiking, hunting
11. Florida Keys	Monroe	Everglades	948	fishing, hiking
12. Goethe	Levy	Northeast	49,949	fishing, horseback riding, hunting
13. Guana River	St. Johns	Central	9,815	fishing, hiking, horseback riding, hunting
14. Half Moon	Sumter	Central	9,479	fishing, horseback riding, hunting
15. Hilochee	Lake	South	5,377	hiking, hunting
16. Holey Land	Palm Beach	Everglades	35,350	camping, fishing, hunting
17. Homosassa	Citrus	Central	5,514	fishing, hunting
18. Joe Budd	Gadsden	Northwest	10,539	camping, fishing, horseback riding, hunting
19. Jennings Forest	Clay	Northeast	20,885	fishing, hiking, horseback riding, hunting
20. Jumper Creek	Sumter	Central	10,512	fishing, camping, hiking, horseback riding, hunting
21. J. W. Corbett	Palm Beach	Everglades	60,228	camping, fishing, hiking, horseback riding, hunting
22. Lake George	Putnam, Volusia	Central	49,554	camping, fishing, horseback riding, hunting
23. Lake Wales Ridge	Polk, Highlands	South	9,257	fishing, hiking, horseback riding
24. Little Big Econlockhatchee	Seminole	Central	4,948	camping, fishing, hiking, horseback riding, hunting
25. Little Gator Creek	Pasco	South	566	fishing, hiking
26. OK Slough	Collier	Everglades	32,162	fishing, hunting
27. Point Washington	Bay, Walton, Washington	Northwest	75,552	camping, fishing, hiking, horseback riding, hunting
28. Richloam Baird Unit	Sumter	Central	11,567	fishing, hunting
29. Rock Springs Run	Lake, Orange	Central	14,046	fishing, hiking, horseback riding,
30. Rotenberger	Palm Beach	Everglades	28,775	camping, fishing, hunting
31. Tate's Hell	Franklin, Liberty	Northwest	150,321	camping, fishing, horseback riding, hunting
32. Three Lakes	Osceola	Central	50,589	camping, fishing, hiking, horse back riding, hunting
33. Tiger Bay	Volusia	Central	23,413	fishing, horseback riding, hunting
34. Tosohatchee	Orange	Central	30,701	camping, fishing, hiking, horseback riding, hunting
35. Triple N Ranch	Osceola	Central	10,894	camping, fishing, horseback riding, hunting
36. Twin Rivers	Hamilton, Madison, Suwanee	Northeast	9,288	camping, fishing, hiking, horseback riding, hunting
37. Seminole Forest	Lake	Central	12,524	camping, fishing, hiking, horseback riding, hunting
38. Walk-In-The-Water	Polk	South	5,958	camping, hiking, horseback riding, hunting
39. Yucca Pens Unit	Charlotte	South	4,005	fishing, horseback riding, hunting

A Nature Photographer Looks at

Mysterious Florida Mangroves

Text and Photographs by James Phillips

Where the flats meet the shoreline, among the hidden pockets of black muck, the footing is tricky, to say the least. In the tannin-laced shallows, dark clouds of leaf debris roil up with every step. When they break against the surface, the stench is truly awful. Later, sun and moon will draw the tide across the flats and into the estuaries and distribute this odorous fog of nutrients. Falling at an annual rate of three and a half tons per acre, mangrove leaves will sustain fungi, bacteria, protozoans, marine worms, copepods, amphipods, shrimp, crabs, mollusks and striped mullet.



Red mangroves propagate Ft. DeSoto Park, pages 24-25.

From just above New Port Richey, south to the keys and north again to St. Augustine, mangroves dot the shore. They're more abundant on the landward flanks of barrier islands and the sheltered mouths of estuaries, thriving in places where the wave energy is low and the water is so salty few other terrestrial plants can survive.

Three species are found in Florida. Red mangroves, *Rhizophora mangle*, grow at, or a little above, mean sea level. Their long prop roots arch into the sea like an inverted antler, providing sanctuary for young fish and anchorage for oysters and barnacles. Black mangroves, *Avicennia germinans*, colonize the upper reaches of the intertidal zone. Clusters of odd "breathing tubes", called pnuematophores, grow from their shallow, extensive root systems, projecting from the mud like thousands of slender cigars. White mangroves, *Laguncularia racemosa*, favor slightly higher ground, thriving in soil that's seldom flooded, except during the highest tides and storm surges. They are usually accompanied by a fourth species, Buttonwood, *Conocarpus erecta*, considered a "mangrove associate" because it lacks some of the morphological adaptations possessed by the other three.

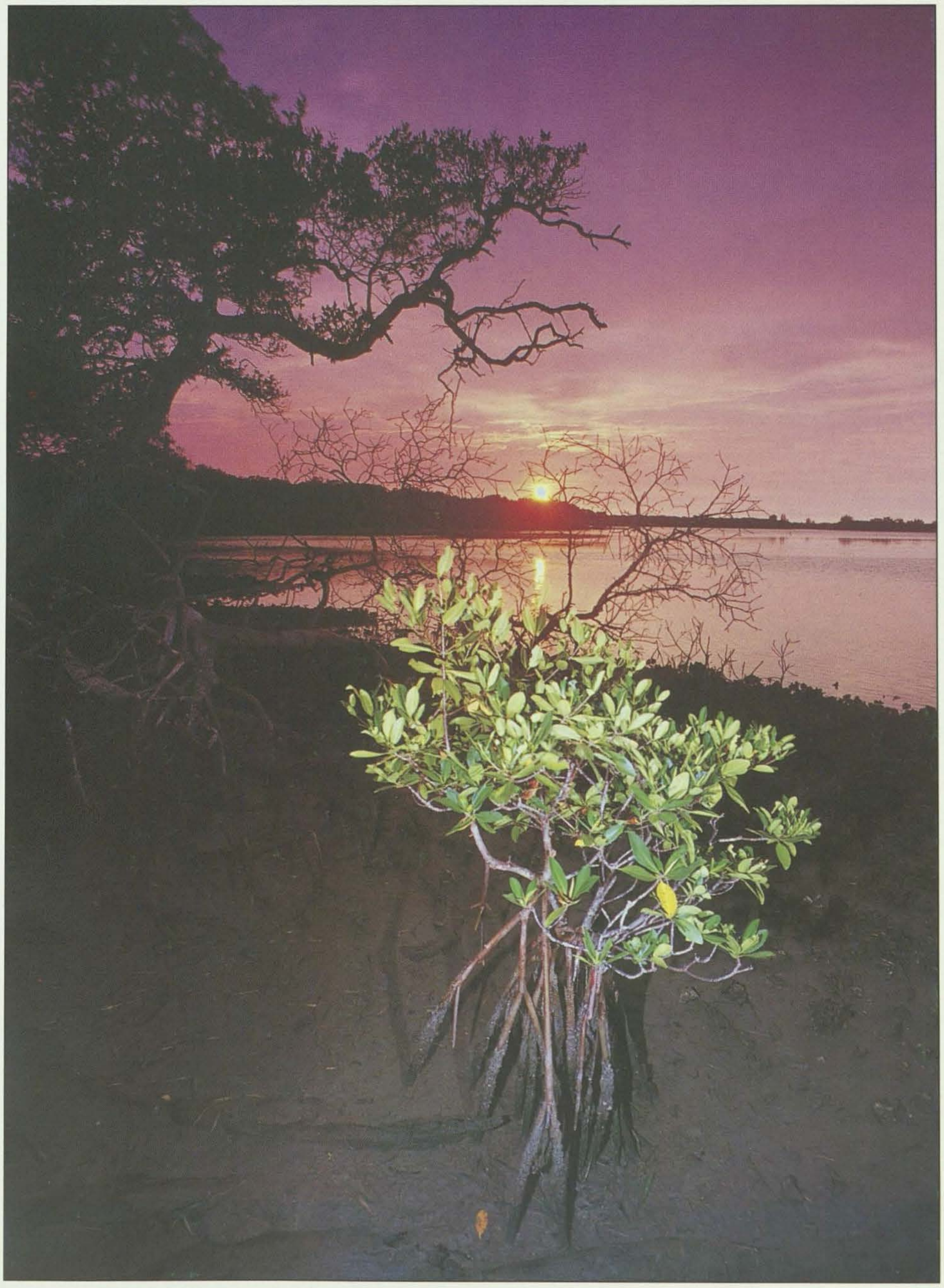
The main thing that sets mangroves apart from most other trees is the way they handle salt. They're facultative halophytes, which means they can grow in either fresh or salt water. In saline habitats they face less competition from other plants. Some mangroves filter salt from their roots, while others excrete it from their leaves. Black mangrove leaves, for example, often bear a crust of salt on the underside, exuded by a gland near the stem. Mangroves are also viviparous ("live-bearing"). Their seedlings, called propagules, germinate while still on the tree. The propagules of black and white mangroves are comparatively small and short lived, but those of the red mangrove are remarkable. They're green, pencil-shaped, and up to a foot in length.

Like little torpedoes, they drop into the sea, drifting for thousands of miles, and remaining viable for up to a year. ▷

Eventually one end becomes waterlogged, causing the propagule to float vertically. Now it's ready to take root. If it comes to rest on a tropical mud flat, the oscillations of the waves will embed the tip in the sediment, and the seedling will grow.

Mangroves may seem abundant, but their numbers have declined. According to some estimates, at least 125,000 acres of mangrove forest have been sacrificed to waterfront development, with most of the loss occurring since 1950. About half a million acres remain. In 1985 the passage of the Mangrove Protection Rule strictly curtailed trimming, removal or defoliation of Florida mangroves. For 10 years it was the subject of bitter complaints from developers and waterfront property owners who found it too restrictive. In 1995 the Florida Legislature passed the Mangrove Trimming and Preservation Act which eases regulations regarding the trimming and management of mangroves, particularly those occurring in "narrow riparian fringes" (mangrove thickets less than 75 feet wide measured perpendicular to the shoreline). Property owners who preferred that their sunsets not be framed in mangrove branches or otherwise encumbered by indigenous flora were pleased. Marine biologists and environmentalists were not.

A flowering black mangrove



A young red mangrove about 5 years old

Florida's mangroves face a number of other, more pressing, hazards. Large-scale wetland preservation typically involves complex water management issues. Projects that effect the hydrologies of wellfields and rivers can have major implications for coastal and estuarine mangrove communities. Dykes and dams, pollution from oil spills and runoff, the dredging of seaports and the water demands that accompany human population growth, all impact coastal ecosystems in ways that are very difficult to remedy.

It's sunset on Tampa Bay. I'm in a tiny nature preserve near a busy causeway, on the grounds of an opulent hotel. The tide is well out; the oysters crunch underfoot. The management has been gracious enough to allow me entry here, and I've set my tripod in the rapidly lengthening shadow of a single tree. As the sun hits the horizon, the blue sky goes amber, then magenta and finally purple.

The tree I have chosen, a red mangrove, has become a flat, textureless black silhouette. Poised on its spindly, barnacled prop roots, it seems frozen in mid-scuttle, on the verge of leaving. Soon it is too dark to continue, and I didn't really get the shot I wanted.

A small flock of roseate spoonbills settles nearby and quietly begins to feed. The thrill of their proximity overcomes the mild letdown I had begun to feel. The act of photography is an attempt to understand something, if only in visual terms. It is also an attempt at preservation, if only a symbolic one. Tonight, although I have succeeded in neither, it's enough.

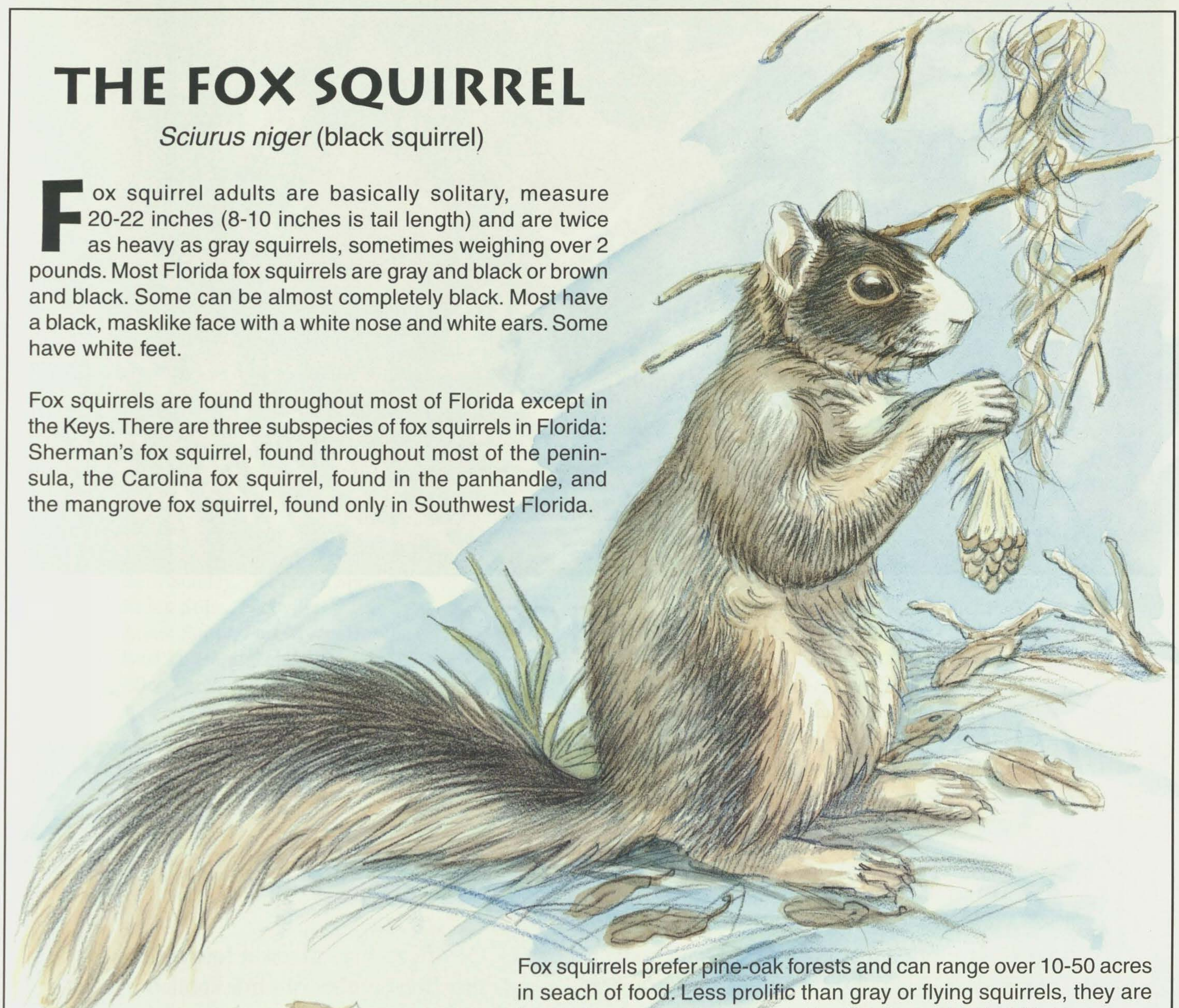
James Phillips is a frequent contributor to Florida Wildlife.

THE FOX SQUIRREL

Sciurus niger (black squirrel)

Fox squirrel adults are basically solitary, measure 20-22 inches (8-10 inches is tail length) and are twice as heavy as gray squirrels, sometimes weighing over 2 pounds. Most Florida fox squirrels are gray and black or brown and black. Some can be almost completely black. Most have a black, masklike face with a white nose and white ears. Some have white feet.

Fox squirrels are found throughout most of Florida except in the Keys. There are three subspecies of fox squirrels in Florida: Sherman's fox squirrel, found throughout most of the peninsula, the Carolina fox squirrel, found in the panhandle, and the mangrove fox squirrel, found only in Southwest Florida.



Fox squirrels prefer pine-oak forests and can range over 10-50 acres in seach of food. Less prolific than gray or flying squirrels, they are becoming increasingly rare in the Southeast United States.

The favorite food of fox squirrels includes walnuts and hickory, but they also eat acorns, hazelnuts and fruits. Seeds and buds are consumed when nuts are not available. Though classified as a tree squirrel, it spends most of its time on the ground. It prefers a leaf nest about 30 feet above ground but has also nested in cabbage palms and clumps of bromeliads.

A newborn will come into the world weighing 1/2 ounce and will become self-supporting by 12 weeks of age. They live up to 6 years in the wild.

art by Lizabeth West

American Robins by Ted Rose

The 1999 *Wings Over Florida* Certificate Awards

Wings Over Florida recognizes bird-watchers in the state. Certificates are given at four different levels: chickadees, frigatebird, bunting and caracara, depending on the number of birds spotted in the wild.

Chickadee 50-149 Florida Birds

Phillip Allman, Naples
Justin Arnold, Tampa
Janet Arthurs, Ocala
David Baker, Ft. Myers
David C. Bornmann, Dunedin
David L. Brahier, Panama City
Joan Byrne, Pompano
Marion J. Carrier, Pensacola
Jerry Carrier, Pensacola
Lynda Christie, Crystal River
Venus B. Cochran, Perry
Allison G. Cole, Ft. White
Michelle Renee Daniel, Pensacola
Karen A. DeBonville, Edgewater
Rep. Paula Dockery, Lakeland
Orville Erickson, Brooksville
Nancy Galiano, Orlando
Marjorie Gay, Bartow
Bonnie Gering, Brooksville
Jay R. Getty, Oviedo
Ruth Anne Gibson, Bartow
John Ellis Gibson, Bartow
Shirley S. Glenn, Homestead
Jacquelyn Goad, Port Orange
Marsha Hartley, Port St. Lucie
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Dana Hartwig, Hollywood
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Linda Mink, Tuscaloosa, AL
Jeremy D. Moore, Rockledge
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Ryan P. O'Meara, Tallahassee
Sharon Peeples, West Palm Beach
Melanie Price, Lantana
Brittni Price, Lantana
Jennifer Rachels, Fernandina Beach
Kathi Rader-Gibson, Englewood
Elizabeth Reichwald, Tampa
Elsa M. Alvear Rodriguez, Pompano Beach
Thomas A. Rodriguez, Winter Park
Marlene Roesch, Parma
Marilyn J. Smith, Lakeland
Lauren Smith, Jupiter
Lawson E. Snyder, Tallahassee
Beth Stanley, DeFuniak Springs
Robin Stiles, Niceville
Annie Suitor, Fort Myers Beach
Karl Thiele, Lakeland
Ellen Variz, Tampa

Caracara by Lynn Stone

Richard Vorce, Sarasota
Ivy D. Wells, Winter Haven
Elan Winkler, Mountain View

Frigatebird 150-249 Florida Birds

Laurie Arnold, Tampa
Patricia Sawyer Ashton, Gainesville
Gary Bass, Pensacola
Daniel Blasky, Gainesville
Sherry Cummings, Boynton Beach
Kendra Edmondson, Hollywood
Robert Goad, Port Orange
Irene Hernandez, Redington Shores
Thomas E. Jones, Leesburg
Clay Kelsey, Dunedin
Sarah Linney, Cocoa
Ed Moyer, Tallahassee
Constance E. Palmer, Altha
Kathi Rader-Gibson, Englewood
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Elsa M. Alvear Rodriguez, Pompano Beach
Thomas A. Rodriguez, Winter Park
Marlene Roesch, Parma, OH
Tina Van Ghent, St. Augustine
Roger Van Ghent, St. Augustine
Joann M. Van Tine, Cape Coral
Deane L. Woolf, Boynton Beach
William J. Zehner, Lynn Haven

Bunting 250-349

Bernie Allen, Interlachen
James R. Dennis, Ft. Collins, CO
Susan Epps, Ft. Lauderdale
Teresa Fiorillo, Titusville
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Marion Kittredge, Sebring
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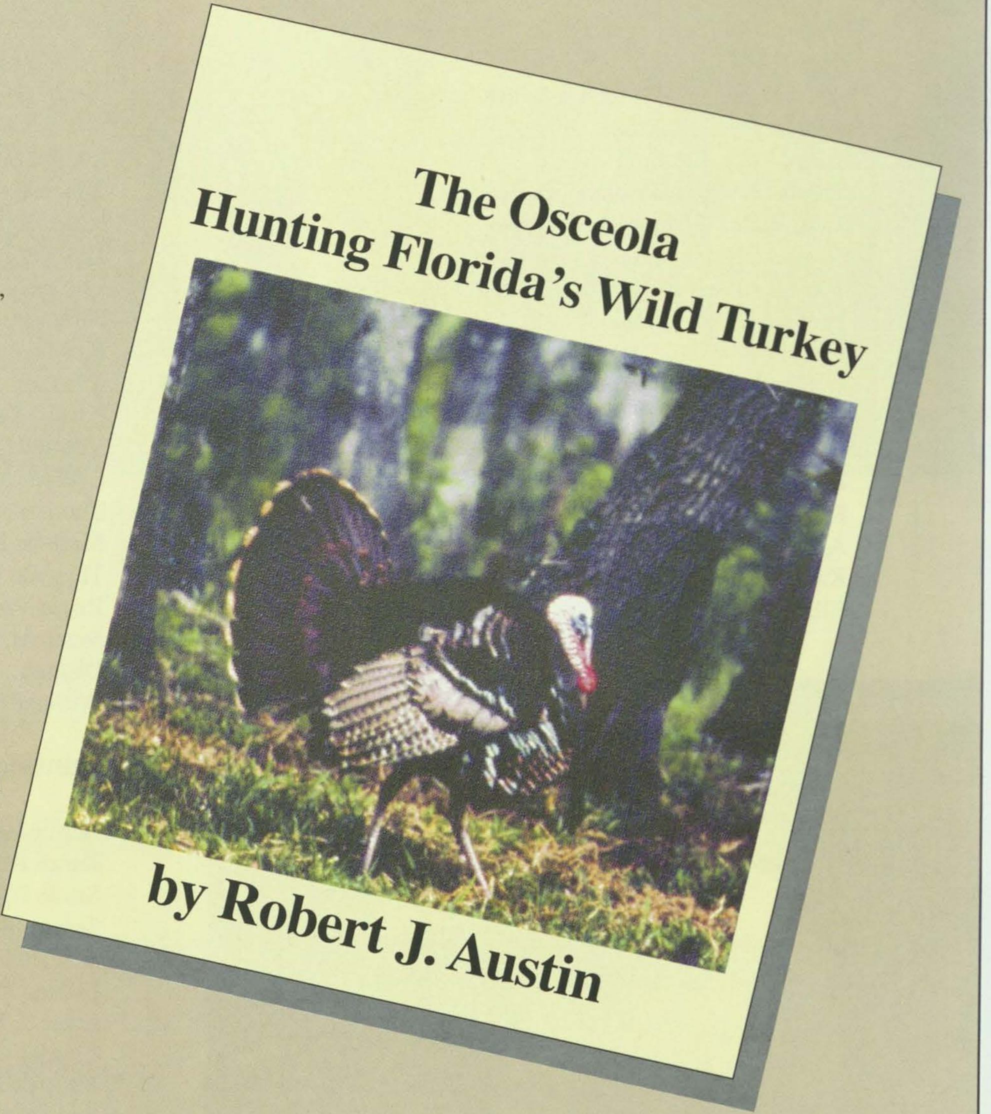
BOOK REVIEW

***The Osceola: Hunting Florida's Wild Turkey* by Robert J. Austin**
Reviewed by Henry Cabbage
Wright Publishing, 1997
64 pages, $10.50


The Osceola
Hunting Florida's Wild Turkey
by Robert J. Austin

Robert J. Austin, who likes to be called "Turkey Bob," lays out the secrets of successful hunting of the Osceola turkey in his book, *The Osceola: Hunting Florida's Wild Turkey*.

Austin's admiration for the turkey subspecies that occurs nowhere else in the world is evident throughout the book. He says it's his opinion that the Osceola is the toughest bird in the Grand Slam (harvesting each of the four turkey subspecies) but well worth the effort.

"The Osceola is truly a magnificent bird," Austin writes. "...The only thing predictable about the Florida wild turkey is that he is unpredictable."

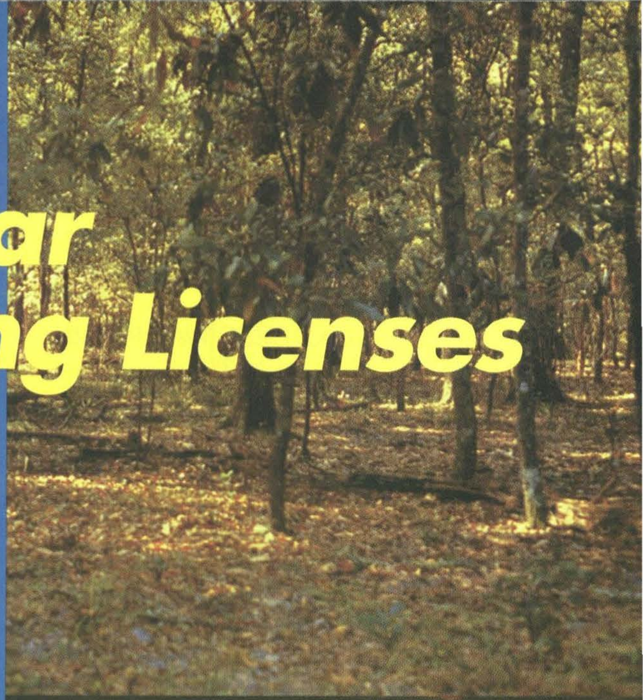
Austin notes that the Osceola, a little smaller and longer-legged than the eastern subspecies, is well adapted to the swamps of central and south Florida, and says that's where sportsmen should look for them. He says the Osceola's favorite foods are acorns, palmetto berries, grasshoppers, galberries, pine and maple mast, mushrooms, crayfish, lizards, snails, seeds and flowers. That's the kind of tip Austin shares with his readers throughout the book.

The greatest strength of Austin's book is the simple, concise pointers it yields without forcing the reader to sort through trivial details. It's an effective, thorough set of instructions on how to bag an Osceola turkey. It tells where, when and how to find the birds. It tells how to dress for the hunt and what kinds of equipment to use. Calling the turkey and camouflage are perhaps the two most critical elements in turkey hunting, and Austin shares the secrets he's learned through his years as a hunting guide.

The Osceola: Hunting Florida's Wild Turkey includes some of Austin's favorite wild turkey recipes and information about taxidermists and guides – all the components of a valuable resource for the sportsman who pursues the Florida subspecies of America's most sought-after game bird.

Perhaps the most endearing part of the book is the one-half-page chapter titled "The Future of Hunting Depends on Me." That chapter touches on a topic that all hunters should always bear in mind. The future of hunting does depend on the hunters' public image and adherence to safe, ethical practices. Respect for the environment, property boundaries and the law are the sportsman's only real weapons in the struggle to preserve a hunting legacy for future generations. I'm glad Austin takes the time to remind us of that.

Austin's book is available, via mail order by writing to: Robert Austin, P.O. Box 490, Haines City, FL 33845-0490. The price is $10.50 plus $1.25 for shipping and handling. Florida residents should add 6-percent sales tax, for a total of $12.38.



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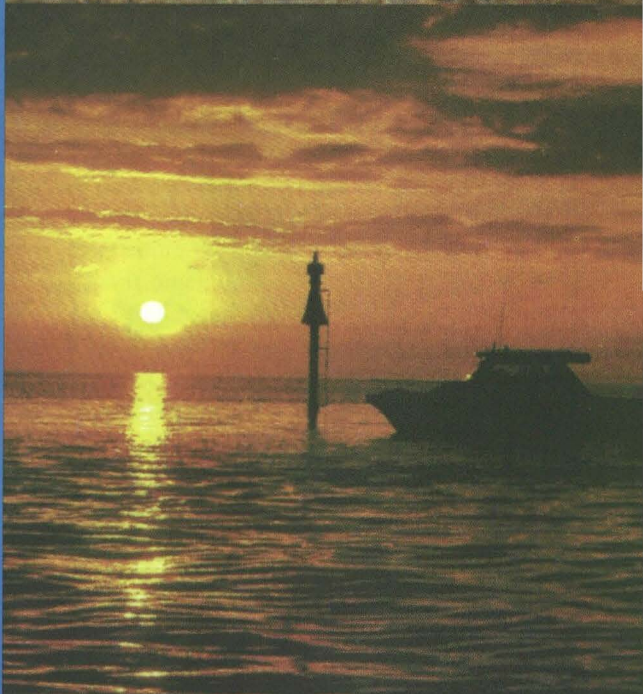

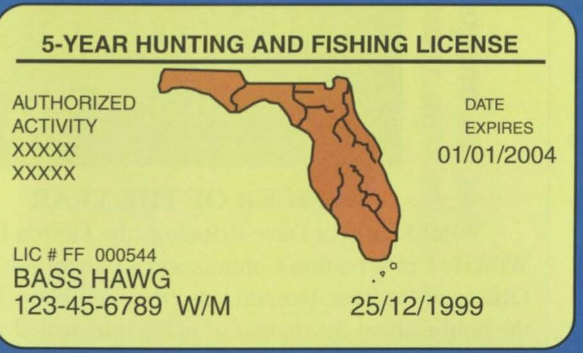

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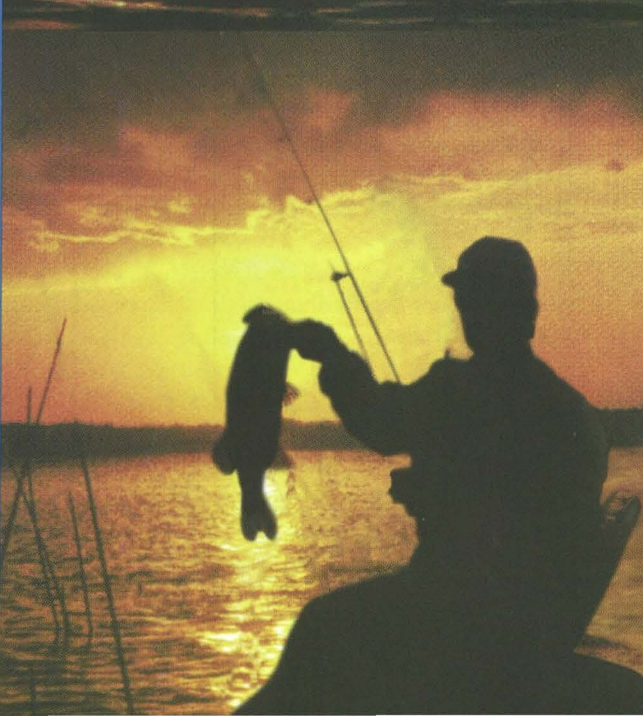

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CONSERVATION UPDATE

Compiled by James Call

ROADLESS WARRIERS

A majority of America's 50 million hunters and fishers want existing roadless areas in national forests to remain roadless, according to a national survey paid for by the Theodore Roosevelt Conservation Alliance. However, respondents also want those roadless acres to remain open for hunting, fishing and other outdoor recreation. For more information you can contact the group at (877) 770-8722

WARMING THE WEB

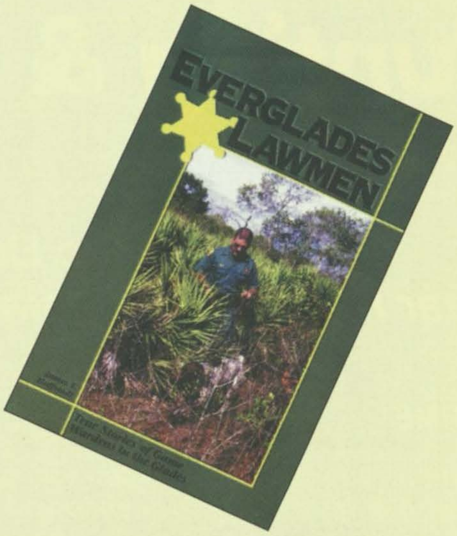
Concerned about global warming and climate change? The EPA has established a web site predicting how climate change may affect wildlife and public lands. It features a fact sheet that speculates how climate change will affect each state. Point your browser to **www.epa.gov/globalwarming/stakeholders/wildlife/**.

A FLORIDA FIRST

The first two whooper chicks born in the wild east of the Mississippi in 100 years hatched near the Kissimmee Prairie in March. Whooping cranes nearly became extinct in the 1930s, with only one small flock nesting in Canada. The parents of the chicks descend from that group. They were raised in captivity in Maryland and Michigan and met after being sent to Florida in the early 1990s to establish a whooper population here (whooping cranes mate for life). Biologists are hopeful the births will insure the experiment's success.

COOL ENERGY TIPS

Summer heat is about to descend on much of Florida. Advice on how to cut your cooling cost can be found by pointing your browser to a Department of Energy site. A new home energy savings guide can be read at **http://www.eren.doe.gov/consumerinfo/**. You can call (800) 363-3732 to receive a free copy.



OFFICER IS AN AUTHOR

Florida Fish and Wildlife Commission officer Lt. James T. Huffstodt's review of Everglades lawmen has been published by Pineapple Press. *Everglades Lawmen: True Stories of Game Wardens in the Glades* traces the history of game wardens from the time when they had to buy their own uniforms and guns to the present-day wildlife officers. Huffstodt is a frequent contributor to *Florida Wildlife*.

Major McCallister

OFFICER OF THE YEAR

Wildlife officer Dave Rosado is the Florida Fish and Wildlife Conservation Commission's Law Enforcement Officer of the Year. Rosado was cited for his work in educating the public about the danger of being intoxicated while boating. Officials credit Rosado with a "considerable" increase in the number of designated-operators (non-drinking boat drivers) in Duval County waters. Rosado participated in a year-long compaign that distributed pamphlets and educational materials to boaters about the danger of drinking and boating. He also performed 1,139 boat inspections, made 445 arrests and issued 1,058 warnings during 1999.

Ask The Lieutenant

Question for you, Lt:

Does my Lifetime Sportsman's License (issued September 25, 1998) allow me to hunt on Moore's Pasture? Seems it is now a "User Permit" area. But according to the 1998-99 Hunting Handbook, my Lifetime Sportsman's License ". . . includes permits and fees which are required now and those that may be created in the future."

That line is missing from the 1999-00 Hunting Handbook. What gives? Does the Lifetime Sportmen's License covers "User Permit" areas?

Michael B

Answer for you Mike:

No! It does not. Here's why. The Recreational Use Permits concept (User Pay) was developed as a way to keep privately owned lands open to the public. The FWC negotiates a fee with the land owner who agrees to keep the property a Type 1 Wildlife Management Area.

The legislation that enabled the FWC to enter into this arrangement specifically states that all hunters, with the exception of dependent children under the age of 16, must have purchased a permit. While a Lifetime Sportsman's License and a Five-Year Hunting License purchased before July 1, 1998, are valid for Regular Quota and Special-Opportunity hunts they cannot substitute for a Recreational Use permit.

Mr. Lieutenant:

I'm headed to Bay County for a holiday and need some fishing information. We'll be staying near Lake Powell and friends tell me we'll have access to the lake. It's brackish, so what type of permit do I need? What specials are available and how do I fish for them?

–Randy from Missouri

Randy, Specials? Did you say you were going fishing or out to eat? If it's fish you want here's some advice.

Because it is brackish, Lake Powell is home to both saltwater and freshwater species such as speckled trout, redfish, flounder, largemouth bass, bluegill, etc.

When fishing in brackish waters the license you will need will depend on the fish you want to catch. If you purchase only a non-residential saltwater license, you can fish and keep saltwater species that are within bag and size limit. However, you would have to immediately release unharmed any freshwater fish. Conversely, the same rule applies with only a non-res freshwater license.

Now about Lake Powell. It's a fine lake that is landlocked much of the year. A better choice for some fishing while on vacation in Bay County is Burnt Mill Creek and Crooked Creek on Highway 388 between Highways 79 and 77. Both creeks empty into the bay and again you may catch traditional saltwater and freshwater species. Take along some bug spray because the sand gnats can be a problem. You can purchase a fishing license over the telephone by calling 1-888-FISH-FLORIDA (347-4356).

Now if it's specials you want, then pick up a visitor's guide and read about area restaurants. Either way, enjoy your visit. And be sure to come back, ya hear?

Dear Lieutenant!

We recently moved to Estero in Lee County. It's an undeveloped area and we have seen numerous wildlife that we can identify except for one.

It's a squirrel-like creature the size of a cat. It has an extremely bushy tail that is much larger than one finds on squirrels. It is brown in color except for the black on its head and down the back. The stomach area is orange in color. This animal stands up on its hind legs and runs differently than the gray squirrel. Can you identify this creature for us?

– H. Hester

H., welcome to Florida. Although it is hard to identify wildlife without a picture, I think what you described is a fox squirrel. Turn to page 27 and see if this is the fellow you're talking about.

Florida WILDLIFE®

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- **Lake Placid Murals**
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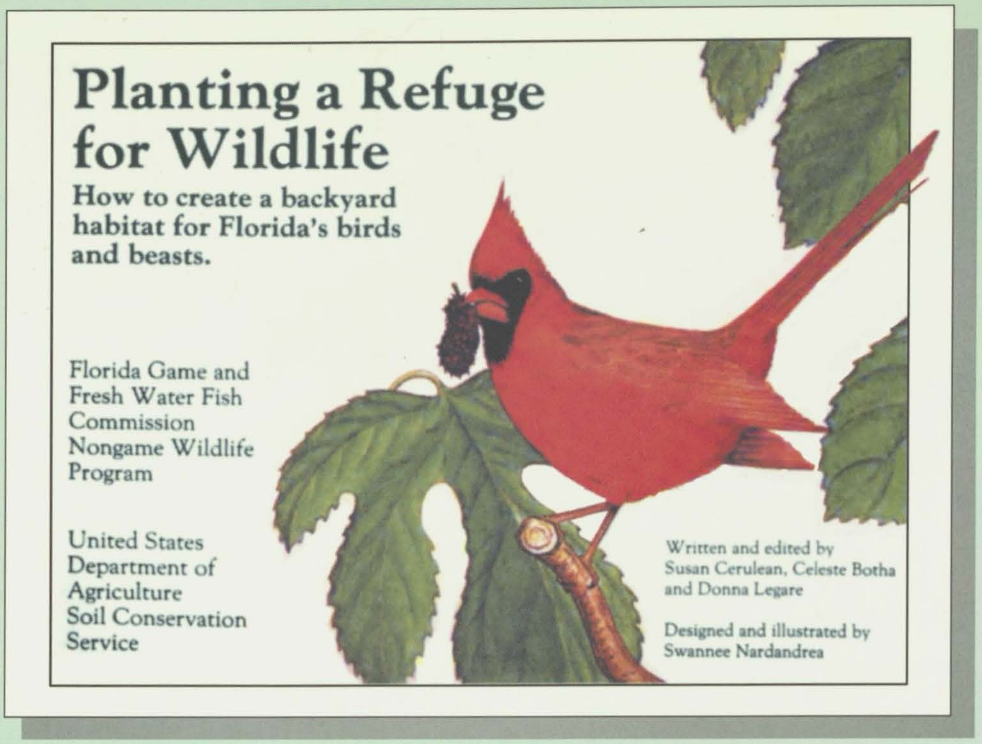

Planting a Refuge for Wildlife

How to create a backyard habitat for Florida's birds and beasts.

Florida Game and Fresh Water Fish Commission Nongame Wildlife Program

United States Department of Agriculture Soil Conservation Service

Written and edited by Susan Cerulean, Celeste Botha and Donna Legare

Designed and illustrated by Swannee Nardandrea

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Receive a FREE copy of *Planting a Refuge for Wildlife* to find proven ways to encourage a broad cross-section of Florida wildlife to visit and live around your home. No matter what your time or financial constraints, you can take some of these simple steps to improve wildlife habitat in your back yard. For every two one-year subscriptions ($24) to *Florida Wildlife* we'll send you a copy of *Planting a Refuge for Wildlife* by Susan Cerulean, Celeste Botha and Donna Legare.

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